Standard Agenda Item Cover Sheet

Agenda Item No. _____

Meeting Date: _____

☒Consent Section ☐Regular Section ☐Public Hearing

Requires Chair Signature? ☐Yes ☒No Includes a Technology Component? ☐Yes ☒No

Subject: Mosaic's 2024/2025 Consolidated Mines DRI #263 Annual Report			
Department Name: Environmental Services Division			
Contact Person: Kim Cruz		Contact Phone: (813) 276-8370	
Sign-Off Approvals:			
George B. Cassady	*3/5/2026*	*Kevin S Moran*	*2/17/2026*
Assistant County Administrator	Date	Department Director	Date
N/A		Nancy Takemori	1/22/2026
Management and Budget – Approved as to Financial Impact Accuracy	Date	County Attorney – Approved as to Legal Sufficiency	Date

Staff's Recommended Board Motion:
Acceptance of the Consolidated Mines 2024/2025 Annual Report for informational purposes. This phosphate mining and reclamation report provides a general review of mining operations, reclamation during the preceding reporting year and identifying expected activity for the subsequent reporting year. Based on the information provided in the 2024/2025 Annual Report, the review verifies compliance with the requirements of DRI 263, and projected activities are focused on supporting progression of reclamation.

Financial Impact Statement:
No County funds are required for this item.

Background:
Pursuant to Section 8.02.09 of the Hillsborough County Land Development Code, a phosphate mining permittee is required to submit an Annual Report of Operations containing a general review of mining operations and reclamation during the preceding reporting year and identifying expected activity for the subsequent reporting year.

List Attachments:
The following are combined into one document:

- Hillsborough County Staff Review Report
- Attachment 1: Agency Comments
- Attachment 2: Mosaic's Consolidated Mines 2024/2025 Annual Report

Hillsborough County Florida

A Report Presented to the
Board of County Commissioners
on February 10, 2026, from
Public Utilities Department
Environmental Services Division
regarding
Consolidated Mines 2024-2025 Annual Report
Application No.: PMAR 25-1361
Phosphate Reference No.: 825.04P

Staff Report of the Consolidated Mines 2024/2025 Annual Report

Annual Review of Development Order Compliance Assessment

The Hillsborough Consolidated Mines Development of Regional Impact #213 was approved by the Hillsborough County Board of County Commissioners (BOCC) on March 23, 1995, covering 53,388 acres. The Hillsborough Consolidated Mines Development of Regional Impact #263 Substantial Deviation (DRI #263) was approved on March 11, 2008, and decreased the size to 48,115 acres. Subsequent land acquisitions have increased the total area regulated by DRI #263 to 48,734 acres. The development is located in southeast Hillsborough County and approved for Phosphate Mining. Hillsborough County received Mosaic's notification to exercise permit tolling and extensions granted pursuant to Section 252.363, Florida Statutes for Hurricane Ian. At this time, the project's build out date is February 28, 2038.

Pursuant to LDC Section 8.02.09, the phosphate mining permittee is required to submit an Annual Report of Operations containing a general review of mining operations and reclamation during the preceding reporting year, July 1, 2024, through June 30, 2025, and identify expected activities for the subsequent reporting year.

Agency Review

The Annual Report of Operations (Attachment 2) submitted for the Hillsborough County Consolidated Mine project has been reviewed by the County and other applicable agencies for compliance with the terms and conditions of the Development Order, Operating Permit, and approved plans. The review generated no adverse comments or recommendations (Attachment 1).

Hillsborough County Environmental Services Division recommends acceptance of the Consolidated Mines Annual Report for informational purposes only. Approval by the Administrator and/or the Board of County Commissioners does not relieve the applicant from the responsibility to comply with any applicable federal, state, and other local laws, regulations, and ordinances. Acceptance of the Annual Report of operations and approval of the Annual Review is not a substitute for other approval required by the Land Development Code.

During this reporting year, the following development was reported for informational purposes:

Project Status

The developer of record is Mosaic Fertilizer, LLC, (Mosaic). The authorized agent is Russell T. Schweiss. The Development Order has been amended nine times. Mosaic reports that the total area mined (matrix) through June 30, 2023, was 31,290.3 acres (matrix) of the 48,734 acres of the total ,DRI site.

An unmined tract of land (Folio 88895.0050), approximately 389.9 acers, was sold to Keesai Farms LLC. The land was not part of a County approved mining unit but was part of the DRI #263 boundary. A future modification will remove the sold property from DRI #263.

Mining Operations

Mosaic reports that phosphate mining continued in the Hillsborough Consolidated Mines with approximately 37.3 acres mined in the 2024/2025 report year.

Clay Storage

On November 14, 2019, the Hillsborough County BOCC approved to amend the DRI #263 Composite Development Order and Operating Permit as resolved in Resolution R18-128, subject to the terms and conditions set forth therein. Approval of Resolution R18-129 enabled waste clays originating from other counties to be disposed of in existing Hillsborough County Clay Settling Areas (CSA) and Mosaic will not construct CSAs L-4, L-5, L-6, and F-8. Resolution R18-129 expired on November 14, 2023.

On November 7, 2023, the Hillsborough County Board of County Commissioners adopted Resolution 23-095, amending the DRI #263 Composite Development Order and Operating Permit to extend the time period in which the amount of waste clays determined to have originated from Hardee County may be disposed in designated existing Hillsborough County clay settling areas L-1, L-2, L-3, F-4, F-5, and F-7 until the CSAs are utilized to their full design storage capacity or until November 15, 2028 unless expressly extended.

During 2024/2025 reporting year, clay storage activities continued at F-4, F-5, F-7, L-1, L-2, and L-3 CSAs. The third-party annual dam inspections included in the 2024/2025 annual report indicated that the clay settling areas operated by Mosaic are generally maintained and safely operated within industry standards for their intended use. The third-party inspectors provided recommendations concerning normal maintenance and indicated there were no conditions observed that required immediate corrective action.

Reclamation

Since 1982, Mosaic and its predecessors, Mosaic Phosphates Company and IMC Phosphates Company have requested and obtained written reclamation release letters from the Florida Department of Environmental Protection (FDEP) for certain FDEP Logical Reclamation Units (LRU) in the Consolidated Mines.

Mosaic reports a total of 43.9 acres of wetland mitigation areas related to mining were released by EPCHC during the 2024/2025 reporting year.

Mosaic may request reclamation releases outside of the annual report twice a year in the Spring and the Fall to Hillsborough County.

The spring 2021 release request for 2,915.8 acres in LRUs IMC-FCL-AC(3A), IMC-FCLAC(5), IMC-FCL-LMR(7), IMC-KC-HB(1), IMC-KC-WB(1) was submitted to Hillsborough County on March 24, 2021. On May 16, 2023, Hillsborough County staff requested additional information.

Reclamation activities during the 2024/2025 report year, included:

1) Contouring, 367.5 acres, 2) Upland Planting, 271.2 acres, 3) Wetland Planting, 96.0 acres.

Significant Upland Wildlife Habitat (SUWH)

During the 2024/2025 reporting year, Mosaic planted 88 acres of nursery grown containerized plants within HPB(6) of the SUWH area and all areas previously seeded or top soiled were treated to control nuisance and exotic vegetation. Prescribed burn activity was completed in the HPB(9) area in July 2024.

No owls and no scrub jays were translocated from Hillsborough County during 2024/2025. Mosaic reports that the number of scrub jay families observed within the Mosaic Wellfield Duette Preserve Subpopulation, the Little Manatee River State Park, SWFWMD Coker Tract, and Moody Branch is meeting and exceeding the USFW permit criteria. The annual report indicates that 33 family groups consisting of 110 individual scrub-jays were observed, while the permit criteria require 14 family groups. Furthermore, descendants of translocated birds have dispersed to Little Manatee River State Park, FWC Moody Branch Park, and DEP Wingate State Park. The total regional population now numbers 60+ groups and is growing.

During 2024/2025 reporting year, a total of 12 gopher tortoises were transported from Four Corners Mine and released to the Mosaic Wellfield North long-term protected gopher tortoise recipient site.

Annual Financial Responsibility

The 2024/2025 comprehensive (Hillsborough Consolidated Mines, Big Four Mine, and Hopewell Mine) Financial Responsibility Agreement was reviewed and negotiated with the Office of Management and Budget, Hillsborough County Financial and Debt Analysis Department and was approved by the Board of County Commissioners on February 11, 2025.

The proposed 2025/2026 comprehensive Financial Responsibility Agreement includes the following: (1) a Reclamation Surety Bond equal or greater than $93,198,078 (2) an Environmental Liability Insurance Policy in the minimum amount of $43,000,000, and (3) a Corporate Guarantee from the Mosaic Company of Delaware in the amount of $13,214,644 to cover EPC wetland mitigation constructed but not yet released at $7,460 per acre. The total amount of $149,412,722 reported is based on the current level of the Reclamation Bond and Corporate Guarantee, plus the Environmental Liability Insurance Policy. The current Environmental Insurance Policy is valid through 10/22/2025 and is renewed annually.

Projected Development

Mosaic reports the following is projected for the upcoming reporting year:

- Total acreage expected to be mined in the Hillsborough Consolidated Mine during the report year 2024/2025 will be approximately 0 acres.
- Reclamation activities expected during the report year 2025/2026 include 1) Contouring, 781.4 acres, 2) Upland Planting, 730.0 acres, and 3) Wetland Planting, 155.3 acres.

- Clay storage activities are projected to continue at Four Corners Mines CSAs F-4, F-5, F-2D, F-7, and Lonesome Mine CSAs L-1, L-2, and L-3.
- Routine herbicide maintenance for nuisance and exotic plant species will continue on all SUWH areas.
- Supplemental plantings of desirable native species will be conducted as needed within the SUWH areas.
- Within the SUWH areas, additional controlled/prescribed burns are planned for the burn season.
- Initial planting will take place in the SUWH areas within FDEP Reclamation Units LRU HPB(6) and HPB(9).
- Supplemental plantings will be conducted within FDEP Reclamation Units LRU LMR(7) and LMR(6).

Review of Development Order Conditions

A review of development order conditions as defined in Section III Amended Development Order Conditions of the Composite Development Order for Hillsborough County Mines, Consolidation and Extension Phases was conducted. Based on the information provided in the 2024/2025 Annual Report, the review verifies compliance with the requirements of DRI 263 and that existing Standard Operating Procedures and Best Management Practices are being followed. While most of the Section III conditions did not apply based on the 2024/2025 activities or will apply in the future, the following did apply and were found to be in compliance:

1) III.C.1. through 7. Water Management and Supply – Groundwater was found to be in compliance. Mosaic is in compliance with the consolidated water use permit issued from the SWFWMD and data provided in the DRI 263 Environmental Monitoring Report indicated ground water quality met or were below applicable ground water standards.

2) III.D.1. through 6. Water Management Surface Water were found to be in compliance. The DRI 263 Environmental Monitoring Report indicated no degradation of water quality standards by stormwater existing the site.

   All stormwater runoff from the active mine area is released only through Florida Department of Environmental Protection (DEP) National Pollution Discharge Elimination Discharge System (NPDES) permitted outfall locations. Mosaic reported authorized discharges of excess mine recirculation and stormwater through the Four Corners D-001 and Lonesome D-002 FDEP NPDES permitted outfalls during the 2024/2025 reporting year. The sampling results indicated no surface water quality violations of the FDEP permit limits.

   Data downstream of the outfalls shows phosphorus concentrations a surface water sample locations either remained stable over time or decreased slightly, and the biological communities for the surface water bodies scored ‘healthy’. Hillsborough County Environmental Services Division will continue to observe surface water quality data.

3) III.E.1. through 3. Soils were found to be in compliance.

4) III.G.1. Floodplains were found to be in compliance as no mining occurred in the 25-year floodplain.

5) III.I.1,2, and 6. Vegetation were found to be in compliance, SOPs and BMPs are being followed and permits are obtained for gopher tortoise relocations as required.

Project History

On March 21, 1974, the Lonesome Mine Development of Regional Impact was originally approved by the Hillsborough County Board of County Commissioners and was subsequently amended on February 21, 1984, January 9, 1990, September 25, 1990 and May 7, 1991.

On January 15, 1975, the Kingsford Mine Development of Regional Impact was originally approved by the Hillsborough County Board of County Commissioners and was subsequently amended on March 29, 1988.

On January 4, 1978, the Four Corners Mine Development of Regional Impact was originally approved by the Hillsborough County Board of County Commissioners, and was subsequently amended on April 22, 1981, May 13, 1986, January 9, 1990 and September 25, 1990.

On November 8, 1974, the Lonesome Mine Operating Permit was originally issued by the Hillsborough County Board of County Commissioners and has been subsequently amended.

On January 15, 1975, the Kingsford Mine Operating Permit was originally issued by the Hillsborough County Board of County Commissioners and has been subsequently amended.

On January 5, 1978, the Four Corners Mine Operating Permit was originally issued by the Hillsborough County Board of County Commissioners and has been subsequently amended.

On July 1, 1990, IMC Fertilizer, Inc. filed an application for development approval for a substantial deviation to the approved Lonesome, Kingsford and Four Corners DRIs and related operating permit amendments with the Hillsborough County Board of County Commissioners, pursuant to the provisions of Section 380.06, Florida Statutes; and

A 1990 substantial deviation proposed, among other things, the addition of approximately 18,000 acres to form the Extension Phase, the removal of approximately 850 acres from the Lonesome Mine boundary, an addition to the mining area, a revision to the mining schedule and equipment utilization, a revision of the clay and tailing storage areas and disposal methods, an addition to the approved methods for transporting product from the plants, a revision of the employee traffic impacts, the addition of a railroad to connect the Four Corners, Lonesome and Kingsford plants, the upgrading of the Lonesome Plan operations, including wet rock
loading facilities, additional floodplain crossings, and the combination of the three approved mines into a single mine for reporting purposes; and

On or about March 25, 1992, IMC Fertilizer, Inc. requested that the application be divided into Phase I (the "Consolidation Phase") and Phase II (the "Extension Phase"); and

On July 1, 1993, IMC Fertilizer, Inc. became IMC-Agrico (IMC-Agrico).

On July 21, 1993, the Board of County Commissioners (BOCC) adopted Resolution No. R93-0170, granting the consolidation of IMC's existing approved mines (Lonesome, Kingsford, and Four Corners) in Hillsborough County into one mine (DRI-213, Hillsborough County

Consolidated). The Development Order authorized changes to these mines (described below) during Phase I (also referred to as the “Consolidation Phase”). The changes to the original mines include the following: the removal of approximately 850 acres from the Lonesome Mine (LSM) site; the addition of 3,248 minable acres within the existing mines’ boundaries; a revision to the mining schedule and equipment utilization; a time extension for mining; a revision to the clay and sand tailing storage areas and disposal methods; the approval of trucking as a method for transporting product from the plants; the addition of a railroad to connect all three mine plants; the upgrading of the Lonesome Plant operations; and additional 25-year floodplain, wetland and roadway crossings requirements.

On March 23, 1995, the BOCC adopted Resolution No. R95-062, amending the Development Order (DO) for the Hillsborough Consolidated Mines. This was Phase II, "the Extension Phase" of the project, and included the addition of 17,915 acres (14,706 minable acres). The amendment also extended the mining schedule to 2018 (a cumulative four-year extension); extended the reclamation schedule (a cumulative 11-year extension); extended the Development Order by 14 years; added nine new tributary floodplain crossings; and revised tailing and clay disposal plans, including the size, capacity and general locations of nine clay settling ponds in the Expansion area. The amendment indicates which conditions are applicable to which parts of the project. Generally, the conditions of the older DRI’s are applicable to the added areas, unless superseded by stricter conditions. The Development Order expires on December 31, 2027.

On April 25, 1996, the BOCC adopted Resolution No. R96-120, amending the DRI Development Order, Operating Permit, and Master Mine Plan to add the Shuman Tract, approximately 35 acres.

On January 13, 1998, Hillsborough County Board of County Commissioners approved the NOPC and adopted Resolution 98-012, amending the DRI Development Order, Operating Permit, and Master Mine Plan to add the Spivey Tract, approximately 157 acres.

On September 26, 2000, Hillsborough County Board of County Commissioners approved the NOPC and adopted Resolution 00-223, amending the DRI Development Order, Operating Permit, and Master Mine Plan to add the Reynolds Parcel, approximately 357 acres.

On February 11, 2003, the BOCC approved the NOPC and adopted Resolution 03-026, amending the DRI Development Order, Operating Permit, and Master Mine Plan to temporarily authorize a different destination for the approved Lonesome Mine plant truck traffic, so all 160 trucks may travel north on CR 39 from the Lonesome Mine Plant site to the Tampa Bay Water Regional Reservoir site.

On October 25, 2004, IMC Phosphates Company merged with Cargill Crop Nutrition and was renamed Mosaic Phosphates Company.

On January 25, 2005, the BOCC approved the NOPC and adopted Resolution 05-021, amending the DRI Development Order, Operating Permit, and Master Mine Plan to allow construction and operation of the Central Screening Station.

On July 29, 2005, Mosaic Phosphates Company merged with and into Mosaic Fertilizer, LLC.

On March 11, 2008, the BOCC approved the DRI No. 263 Substantial Deviation and adopted Resolution No. 08-047, amending the DRI Development Order, Operating Permit, and Master

Mine Plan. The Development Order authorized among other things the addition of seven parcels containing approximately 1,540 acres to form the Hillsborough County Mines Addition Area - DRI #263 (hereinafter "DRI #263 Addition Area Phase"); the removal of approximately 7,251.5 acres from the Lonesome and Four Corners Mine boundaries; the addition of a mine infrastructure corridor, including expanded use of approved Stream Crossing "O", together with a deletion of Stream Crossings D, M, Q, R, S, and T that will now remain undisturbed; the revision of mining plans and incorporation of clay settling area siting plans conceptually approved by the HCEPC on April 26, 2005 and July 7, 2005, as part of the Life of Mines application for wetland impacts and mitigation approval as depicted on Map 38H-4, Revised Clay Settling Area Locations, 2006 Revisions to MMRP - Revised 5/31/07; the revision of reclamation plans that reflect these changes as well as the reclamation already completed in the DRI #213 area; the updating of DRI #213 Development Order conditions that have been satisfied or are no longer applicable; the updating of the approved methods for transporting product from the plants; the transfer of approved product shipments from Lonesome to Four Corners; and the updating of the product shipment destination points and deletion of certain destination points and route segments; and except for the amendments specified herein the previous DRI and Operating Permit approvals and conditions set forth in the previous development orders shall remain in full force and effect.

On July 15, 2009, Mosaic Fertilizer, LLC filed a Notice of Proposed Change ("NOPC") and an application to amend the Operating Permit/Master Mine and Reclamation Plan for the Hillsborough County Mines Development of Regional Impact DRI #263 proposing to add approximately 75 acres of land, previously owned by Kathy Surface (hereinafter referred to as the "Surface Parcel"), to DRI #263 Composite Development Order and Operating Permit; and

On August 10, 2010, the Hillsborough County Board of County Commissioners approved the NOPC and adopted Resolution R10-113, amending DRI #263 Composite Development Order and Operating Permit, and the Master Mine and Reclamation Plan to add the approximately 75 acre Surface Parcel; and

On April 4, 2018, per Section 252.363, Florida Statues and State of Florida Executive Order Numbers 17-204 and 17-260, the County recognized the extension of the Effective Period of Development Order from December 31, 2027 to December 22, 2030; Mining Completion Date from December 31, 2018 to December 22, 2021; and Reclamation Completion Date from December 31, 2026 to December 22, 2029.

On November 14, 2018, the BOCC adopted Resolution No. R18-0129, amending the DRI #263 Composite Development Order and Operating Permit requirement that the amount of clay produced in each county be disposed of in that county to allow existing clay settling areas (CSA) L-1, L-2, L-3, F-4, F-5, F-7 in Hillsborough County to accept clays from Hardee County until November 14, 2023 and eliminating the construction of specific CSAs.

On January 25, 2019, Tampa Electric Company (TEC), the owner of a portion of Parcel 7 of the DRI #263 Addition Area Phase, a +/- 435 acre parcel (hereafter, the "TEC Parcel"), submitted an application to amend the DRI #263 Composite Development Order and Operating Permit to remove the TEC Parcel from the boundaries of DRI #263 and from the DRI #263 Composite Development Order and Operating Permit.

On June 11, 2019, the BOCC adopted Resolution No. R19-082, amending DRI #263 Composite Development Order and Operating Permit to remove the 435 acres owned by Tampa Electric Company from the boundaries of DRI #263 and from the DRI #263 Composite Development Order and Operating Permit.

On January 14, 2022, the County recognized time extensions per § 252.363, Florida Statutes, and by letter dated September 13, 2021, from counsel for Mosaic. The DRI #263 Composite Development Order and Operating Permit dates were extended as follows: the Section 5 Restriction on Downzoning was extended from December 22, 2030 to October 9, 2032; the Composite Attachment A- Section III.A. Life and Timing of Development-Effective period of Development Order was extended from December 22, 2030 to October 9, 2032; the Composite Attachment A- Section III.A. Life and Timing of Development-Mining Completion Date was extended from December 21, 2021 to October 9, 2023; and Composite Attachment A- Section III.A. Life and Timing of Development-Reclamation Completion Date was extended from December 22, 2029 to October 9, 2031.

On November 7, 2023, the Hillsborough County Board of County Commissioners adopted Resolution 23-095, amending the DRI #263 Composite Development Order and Operating Permit to extend the time period in which certain waste clays originating from Hardee County may be disposed in designated existing Hillsborough County clay settling areas.

On December 23, 2024, the County recognized time extensions per § 252.363, Florida Statutes, and by letter dated November 11, 2024, from counsel for Mosaic. The DRI #263 Composite Development Order and Operating Permit dates were extended as follows: the Section 5 Restriction on Downzoning was extended from October 9, 2032 to July 16, 2036; the Composite Attachment A-Section III.A. Life and Timing of Development-Effective period of Development Order was extended from October 9, 2032 to July 16, 2036; the Composite Attachment A- Section III.A. Life and Timing of Development-Mining Completion Date was extended from October 9, 2023 to July 15, 2027; and Composite Attachment A- Section III.A. Life and Timing of Development-Reclamation Completion Date was extended from October 9, 2031 to July 15, 2035.

On December 4, 2024, Keesai Farms, LLC (“Keesai”), the owner of parcel 088895.0050 (“Keesai Parcel”) of the DRI #263 submitted an application to amend the DRI #263 Composite Development Order and Operating Permit to remove the Keesai Parcel from the boundaries of DRI #263 and from the DRI #263 Composite Development Order and Operating Permit.

Attachment 1: Agency Comments

Submittal Name:	2024-2025 Consoildated Mines DRI 263 Annual Report - Agency Comments
Applicant Name:	Mosaic Fertilizer, LLC
HC Contact Name:	Kim Cruz
HC Contact Phone No.:	813-276-8370
HC Contact Email:	CruzKi@hillsboroughcounty.org
Submittal Date:	8/19/2025
Submittal Due Date:	

For Reviewers Use Only							For Applicants Use Only		For Reviewers Use Only		
Comment No.	Reviewer	Organization/Discipline	Document	Page-Sheet No.	Initial Comment(s)/Request for Info	Comment Date	Applicant Response	Response Date	Response Accepted	Date	Follow-up Comment
1	Diego Guerra		Consoildated Mines DRI 263 AR						NA		
2	Sara Gonzalez	EPC	Consoildated Mines DRI 263 AR		No Comment from Wetlands, Waste or Air Divisions		No comments	12/18/2025	NA		
3	Kim Cruz	EVSD	Consoildated Mines DRI 263 AR	General	Hillsborough County EVSD and Mosaic continue to coordinate with regards to areas needing maintenance, fixing areas that need repair, supplemental planting, and mitigation of invasive species.		Acknowledged	12/18/2025	Yes		
4	Kim Cruz	EVSD	Consoildated Mines DRI 263 AR	General	Reclamation shall be in accordance with the Hillsborough County BOCC approved post reclamation plans. Post reclamation plan amendment applications shall be submitted for changes to be reviewed for approval.		Acknowledged	12/18/2025	Yes		
5	Kim Cruz	EVSD	Consoildated Mines DRI 263 AR	General	Hillsborough County EVSD and Mosaic will continue to confirm and verify the areas that were released from reclamation obligations across all DRI/DO regulated phosphate mines in Hillsborough County.		Acknowledged	12/18/2025	Yes		

Attachment 2: Consolidated Mines DRI#263 2024/2025 Annual Report



The Mosaic Company
Consolidated Mines – DRI #263

2024-2025 Annual Report

August 19, 2025

The Mosaic Company
13830 Circa Crossing Drive
Lithia, Florida 33547
www.mosaicco.com

Tel 813-500-6910
Fax 813-571-6925

August 19, 2025

Ms. Kim Cruz
Environmental Supervisor
Hillsborough County Environmental Services
332 N. Falkenburg Road
Tampa, Florida 33619

RE: ***The Mosaic Company 2024/2025 Hillsborough County Mines Annual Report; DRI #263***

Dear Ms. Cruz:

Pursuant to Sections 8.02.09 and 8.02.10B of the Hillsborough County Land Development Code (LDC), Mosaic is filing an electronic copy of its 2024/2025 Annual Report of Operations for the Consolidated Hillsborough County Mines (DRI #263). Provided Information:

1) The County Annual Report Form for DRI's;

2) The 2024/2025 Annual Report for DRI 263, Hillsborough County Mine on Form RPM-BSP-ANNUAL REPORT-1, as required by the Development Order.

3) The County Annual Report prepared pursuant to the requirements of the Hillsborough County LDC and Operating Permit (R08-047). Included with this report are the required financial responsibility estimates.

A check covering the combination DRI and Phosphate Mining Annual Report review fee and EPC review will be paid to Hillsborough County Board of Commissioners.

Feel free to contact me at Laney.McGraw@mosaicco.com or (863) 267-4585 if you have any questions or require additional information.

Sincerely,

Laney McGraw

The Mosaic Company
Laney McGraw
Mine Permitting Specialist

INDEX
THE MOSAIC COMPANY
HILLSBOROUGH COUNTY MINES
2024/2025 ANNUAL REPORT

TAB	ITEM
1.	DRI Annual Report Exhibit F - List of Permits Exhibit G - Summary status of Development Order Conditions Exhibit H - Distribution List Exhibit I - Cumulative Setback Waivers Exhibit J – Florida Fish & Wildlife Conservation Commission & U.S. Fish & Wildlife Permits
2.	Significant Upland Wildlife Habitat & Wildlife Summary Significant Upland Wildlife Habitat Monitoring Report Environmental Report Wildlife Reports
3.	Hillsborough County Annual Report of Operation & Financial Responsibility
4.	Maps Map 1 – Boundary Map – DRI 263 Map 2 – Previous and Proposed Mining Map 3 – FDEP Reclamation Programs Map 4 – Clay Settling Areas Map 5 – Aerial Photograph Map 6A – FDEP Reclamation Status and EPC Mitigation Status (with LRU Boundaries) Map 6B - FDEP Reclamation Status and EPC Mitigation Status (with MU Boundaries) Map 7 – Hillsborough County Approved Reclamation/Releases
5.	Reclamation Release Status

SECTION 1
DRI ANNUAL REPORT
EXHIBITS F, G, H, I, & J

Reporting Period: July 1, 2024 to June 30, 2025
Month/Day/Year **Month/Day/Year**

Development: DRI #263 - HILLSBOROUGH COUNTY MINES

Location: N/A HILLSBOROUGH
City **County**

Developer: Name: The Mosaic Company

Address: 13830 Circa Crossing Drive

Lithia, Florida 33547
City, State, Zip Code

1) Describe any changes made in the proposed plan of development, phasing, or in the representations contained in the Application for Development Approval since the Development of Regional Impact received approval. Note any actions (substantial deviation determinations) taken by local government to address these changes.

a) Describe changes in the plan of development or phasing for the reporting year and for the subsequent years.

The operation of the mines was conducted according to the plans contained in the approved Development Order and ADA application. This annual report is being submitted under the requirements of the Development Order for the Additional Area Phase, which was approved on March 11, 2008 (Resolution 08-047).

b) State any known incremental DRI applications for development approval or requests for a substantial deviation determination that were filed in the reporting year and to be filed during the next year.

No additional applications were filed.

c) Attach a copy of any notice of the adoption of a Development Order or the subsequent modification of an adopted Development Order that was recorded by the developer pursuant to Subsection 380.06(14)(d), F.S.

No modifications/adoptions have been made during this report period.

2) Has there been a change in local government jurisdiction for any portion of the development since the development order was issued? If so, has the annexing local, government adopted a new Development of Regional Impact Development Order for the project? Please provide a copy of the order adopted by the annexing local government.

There have been no changes in the jurisdiction.

3) Provide copies of any revised master plans, incremental site plans, etc., not previously submitted.

There have been no changes to the approved DRI #263 master plans.

4) Provide a summary comparison of development activity proposed and actually conducted for the reporting year as well as a cumulative total of development proposed and actually conducted to date.

Please refer to the attached annual report of operations to Hillsborough County. The total area mined (matrix) through June 30, 2025, is 31,290.3 acres.

5) Have undeveloped tracts of land in the development (other than individual single-family lots) been sold to a separate entity or developer? If so, identify tract, its size and the buyer. Please provide maps which show the tracts involved.

0888950050	389.9 acres	Keesai Farms LLC
Tract	**Size**	**Buyer**

There was one sale of unmined lands, not apart of an approved Mining Unit, but apart of the DRI 263 boundary this past year. The Property Owners & Folios map shows the tracts of land sold to a separate entity. A survey sketch is attached to the end of this annual questionnaire to show the survey and legal description of land sold during the reporting period. A future modification of DRI 263 will remove this parcel as an unmined boundary.

6) Describe any lands purchased or optioned adjacent to the original Development of Regional Impact site subsequent to issuance of the development order. Identify such land, its size, and intended use on site plan and map.

There were no additional lands purchased or optioned adjacent to the original Development of Regional Impact site subsequent to issuance of the development order during this reporting period.

7) List any substantial local, state, and federal permits which have been obtained, applied for, or denied during this reporting period. Specify the agency, type of

permit, and duty for each.

See Exhibit "F". During the reporting period, LMU 13 CR 39 Setback Waiver (123.01P) was obtained on August 18, 2024 for DRI-263, although the setback waiver is not considered substantial, it may be relevant to the question.

8) Provide a list specifying each development order condition and each developer commitment as contained in the ADA and state how and when each condition or commitment has been complied with during the annual report reporting period.

See Exhibit "G".

9) Provide any information that is specifically required by the Development Order to be included in the annual report.

In the Development Order, Condition S.1. lists several additional items to be included in the annual report. The requirement with the appropriate response follows:

a. The information required by the State Land Planning Agency to be included in the Annual Report, which information is described in the Rules and Regulations promulgated by the State Land Planning Agency pursuant to Section 380.06, Florida Statutes; and

This report fulfills this requirement.

b. A description of all development activities proposed to be conducted under the terms of this Development order for the year immediately following the submittal of the annual report; and

The attached County Report contains this information.

c. A statement listing all Applications for Incremental Review pursuant to this Development order or other applicable local regulations which the Developer propose to submit during the year immediately following submittal of the annual report; and

The attached County Report contains this information.

d. A statement setting forth the name(s) and address of any heir, assignee or successor in interest to this Development Order; and

Mosaic Fertilizer, LLC (MOSF) is the party of record for this Development Order.

e. A statement describing how the Developer has complied with each term and condition of this Development Order applicable when the Annual Report was prepared.

This is contained in Exhibit G attached.

f. [K-120] The Annual Report shall include reports on the status of Mosaic's purchase of extension area agreement lands, water quality monitoring and soils study results, historical and archaeological site activities, reclamation progress, and tributary crossing in addition to mining activities.

There were no additional purchases of applicable land for DRI-263 during this reporting period. Other status reports for water quality monitoring, soil studies, historical sites, etc. can be found within this 2024-2025 Annual Report. Note that the total land area in Hillsborough County regulated by DRI-263 is 48,734.0 ac.

g. [All] The DRI annual report shall comply with the Florida Department of Community Affairs (DCA) report format and DCA informational requirements. The annual report shall also include the following items:

1. cumulative results of setback variance request;

See Exhibit I.

2. summaries of environmental monitoring results, including any violation of standards, for each area of monitoring (including monitoring conducted in association with the additional acreage to be mined in Lonesome and Four Corners Mines);

Results of environmental monitoring are listed in the Summary of Monitoring Program Results and Data section, *See* attached.

3. corrective actions taken for any violation of water quality standards per Chapter 62-303, FAC, Surface Water Quality Standards and Chapter 62-520, FAC, Groundwater Standards, and the results of the corrective actions;

Corrective actions taken, where appropriate, are listed in the Summary of Monitoring Program Data Section of this report.

4. success or problems with implementation of listed species management plans required by the Consolidation or Extension Phase approvals;

The 2025 annual report on Scrub Jays has been included in the wildlife section of this report. A copy of the 2025 bald eagle nest activity survey report is also provided in this section as well as Mosaic's annual gopher tortoise report.

5. mining and reclamation progress (including cumulative totals of acres mined, in reclamation and released by FDEP); and

See response to item 4 of this report and the County Annual Report.

6. assessments of compliance with the approved Consolidation and Extension Phase mining and Reclamation schedules;

See response to item 4 of this report.

7. the results of the regional roadway and bridge structural integrity monitoring conducted by FDOT, Hillsborough and Polk Counties; and

This information has become a classified document, and not available for distribution to the public.

8. reports on any Mosaic agreements with FDOT, Hillsborough and/or Polk County for improvements needed to provide 12-foot lanes and appropriate structural integrity on the regional roadways and bridges in the transportation impact study area;

No agreements have been made to date, and no indication for a need for an agreement. All roads on our currently active haul routes meet the 12-foot lane width requirement.

9. Mosaic shall continue to provide proof of long-term financial responsibility for the reclamation of mined lands in accordance with Hillsborough County and DEP requirements;

This information is found in the attached County Annual Report.

10. Additionally, the first annual report following mining in the Extension Area shall contain descriptions of each of the monitoring programs for the Extension Area including the following elements: sampling locations, parameters and standards; sampling schedule and analysis methods; quality assurance and data reporting;

This information was contained in the 1986 annual report.

10) Provide a statement certifying that all persons have been sent copies of the annual report in conformance with Subsections 380.06 (15) & (18), F.S.

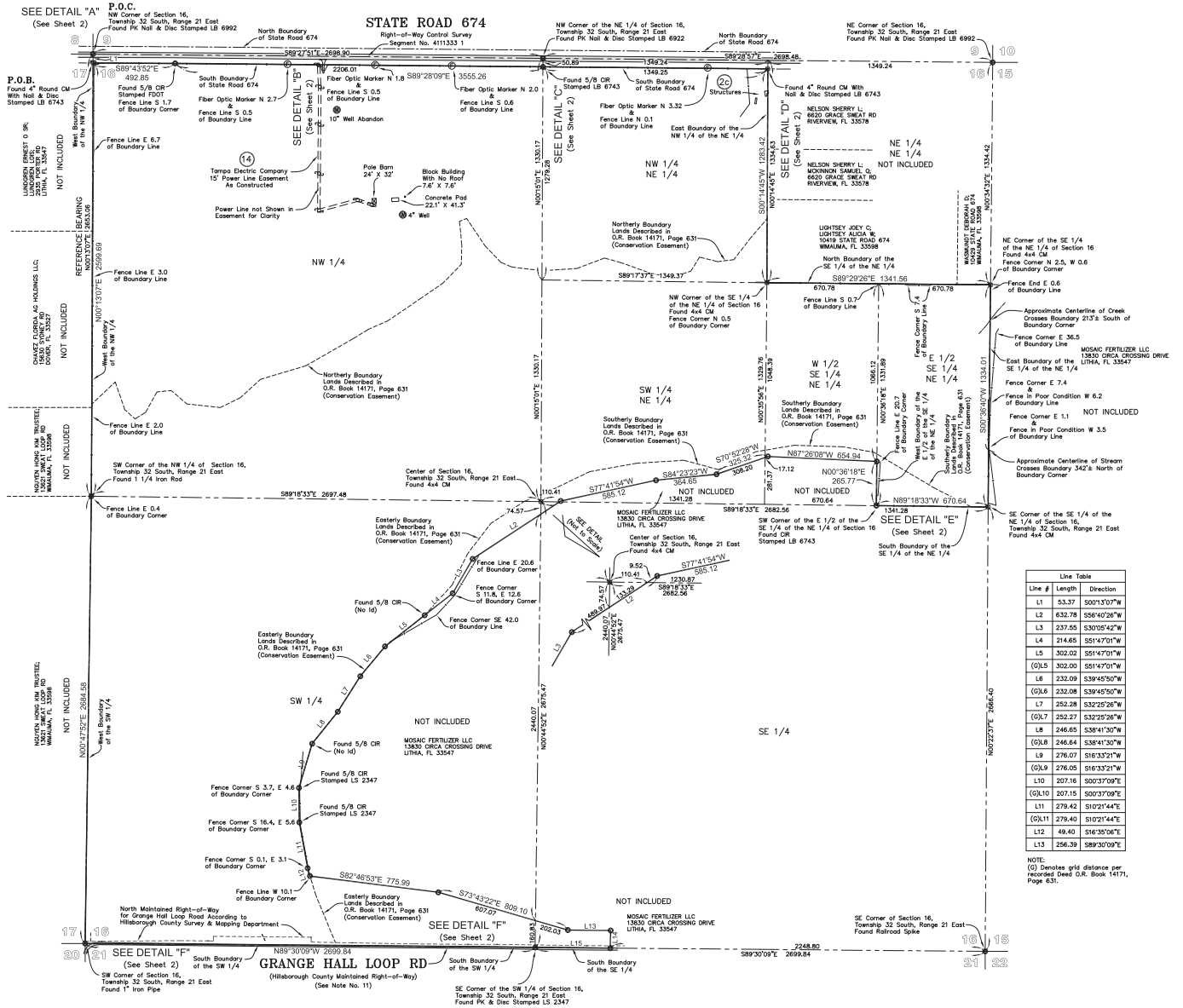
By my signature below I certify that all of those persons shown on the attached distribution list (Exhibit H) on the following page have been provided a copy of this report.

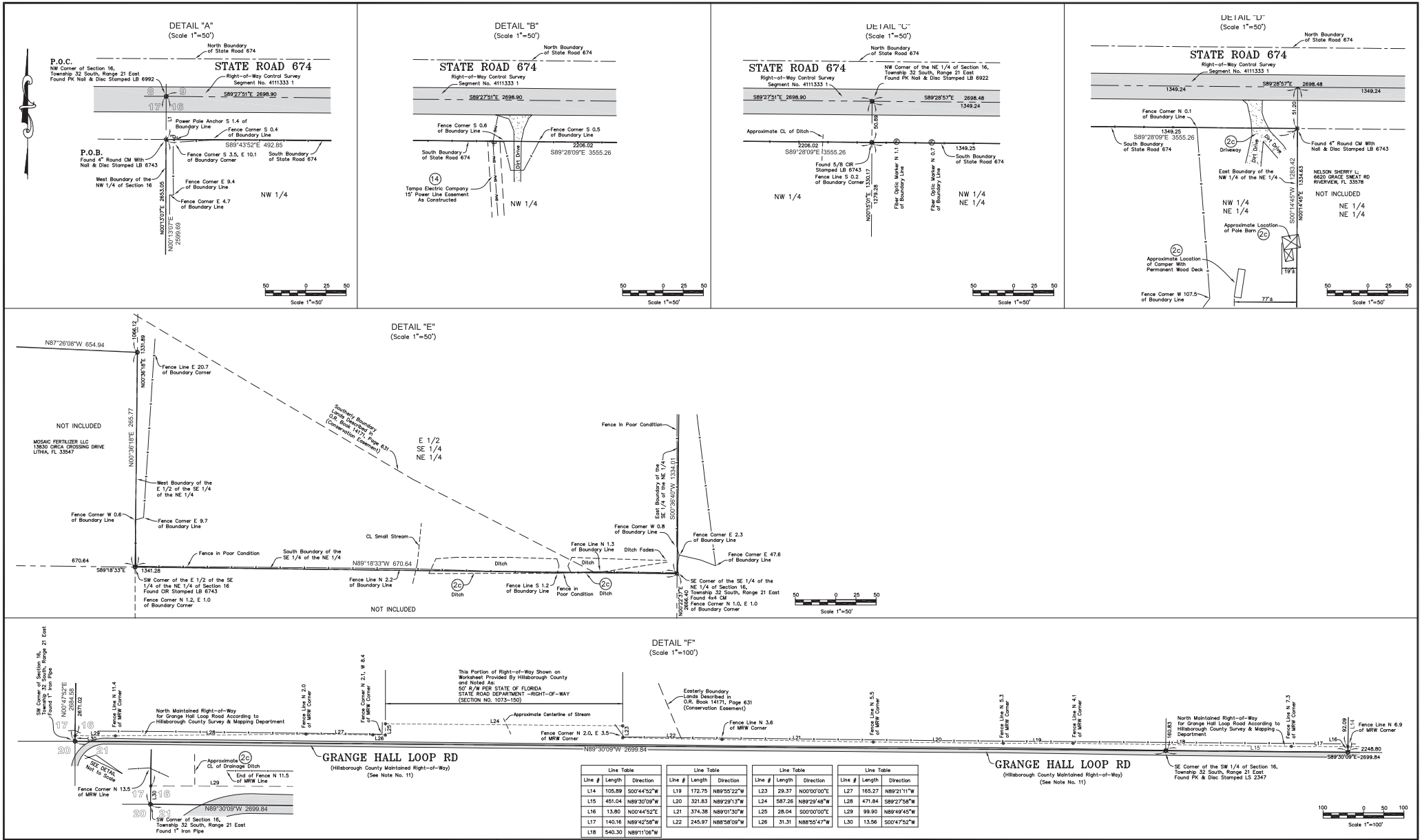


Person completing the questionnaire: Laney McGraw
Title: Mine Permitting Specialist
Representing: The Mosaic Company

Question #5 - Undeveloped Tracts Sold – Supporting Documentation

Survey Sketch Tract 0888950050


STATE ROAD 674
GRANGE HALL LOOP RD
(Hillsborough County Maintained Right-of-Way)
(See Note No. 11)
P.O.C.
NW Corner of Section 16, Township 32 South, Range 21 East
Found PK Nail & Disc Stamped LB 6992
P.O.B.
Found 4" Round CM With Nail & Disc Stamped LB 6743
North Boundary of State Road 674
Right-of-Way Control Survey
Segment No. 4111333 1
South Boundary of State Road 674
Found 5/8 CIR Stamped FDOT
Fence Line S 1.7 of Boundary Corner
Fiber Optic Marker N 2.7
Fence Line S 0.5 of Boundary Line
Fiber Optic Marker N 1.8
Fence Line S 0.5 of Boundary Line
Fiber Optic Marker N 2.0
Fence Line S 0.6 of Boundary Line
Fiber Optic Marker N 3.32
Fence Line N 0.1 of Boundary Line
Found 5/8 CIR Stamped LB 6743
10" Well Abandon
Found 4" Round CM With Nail & Disc Stamped LB 6743
NELSON SHERRY L; 6620 GRACE SWEAT RD RIVERVIEW, FL 33578
NELSON SHERRY L; MCKINNON SAMUEL O; 6620 GRACE SWEAT RD RIVERVIEW, FL 33578
LUNDGREN ERNEST O SR; LUNDGREN ESTER RD 2336 PORTER RD LITHIA, FL 33547
CHAMCE FLORIDA AG HOLDINGS LLC; 15630 SYDNEY RD DOVER, FL 33527
SOUTH HONG KIM TRUSTEE; 10621 SWEAT LOOP RD WIMAUMA, FL 33598
MCKNIGHT FERRON H; 10428 STATE ROAD 674 WIMAUMA, FL 33598
LIGHTSEY JOEY C; LIGHTSEY ALICIA W; 10419 STATE ROAD 674 WIMAUMA, FL 33598
MOSAIC FERTILIZER LLC 13830 CIRCA CROSSING DRIVE LITHIA, FL 33547
Tampa Electric Company 15' Power Line Easement As Constructed
Power Line not Shown in Easement for Clarity
Pole Barn 24' X 32'
Block Building With No Roof 7.6' X 7.6'
Concrete Pad 22.1' X 41.3'
4" Well
Northerly Boundary Lands Described in O.R. Book 14171, Page 631 (Conservation Easement)
Southerly Boundary Lands Described in O.R. Book 14171, Page 631 (Conservation Easement)
Easterly Boundary Lands Described in O.R. Book 14171, Page 631 (Conservation Easement)
Approximate Centerline of Creek Crosses Boundary 213'± South of Boundary Corner
Approximate Centerline of Stream Crosses Boundary 342'± North of Boundary Corner
Found 5/8 CIR (No Id)
Found 5/8 CIR Stamped LS 2347
Fence Corner S 3.7, E 4.6 of Boundary Corner
Fence Corner S 16.4, E 5.6 of Boundary Corner
Fence Corner S 0.1, E 3.1 of Boundary Corner
Fence Line W 10.1 of Boundary Corner
North Maintained Right-of-Way for Grange Hall Loop Road According to Hillsborough County Survey & Mapping Department
SEE DETAIL "A" (See Sheet 2)
SEE DETAIL "B" (See Sheet 2)
SEE DETAIL "C" (See Sheet 2)
SEE DETAIL "D" (See Sheet 2)
SEE DETAIL "E" (See Sheet 2)
SEE DETAIL "F" (See Sheet 2)
SEE DETAIL (Not To Scale)
NOT INCLUDED
REFERENCE BEARING N00°13'07"E 2599.69
NW 1/4
NE 1/4
SW 1/4
SE 1/4
W 1/2 SE 1/4 NE 1/4
E 1/2 SE 1/4 NE 1/4
NW 1/4 NE 1/4
SW 1/4 NE 1/4
NE 1/4 NE 1/4
Center of Section 16, Township 32 South, Range 21 East Found 4x4 CM
NW Corner of the NE 1/4 of Section 16, Township 32 South, Range 21 East Found PK Nail & Disc Stamped LB 6922
NE Corner of Section 16, Township 32 South, Range 21 East Found PK Nail & Disc Stamped LB 6992
NW Corner of the SE 1/4 of Section 16 Found 4x4 CM Fence Corner N 0.5 of Boundary Corner
NE Corner of the SE 1/4 of the NE 1/4 of Section 16 Found 4x4 CM Fence Corner N 2.5, W 0.6 of Boundary Corner
SW Corner of the NW 1/4 of Section 16, Township 32 South, Range 21 East Found 1 1/4 Iron Rod
SE Corner of the SE 1/4 of the NE 1/4 of Section 16, Township 32 South, Range 21 East Found 4x4 CM
SW Corner of the E 1/2 of the SE 1/4 of the NE 1/4 of Section 16 Found CIR Stamped LB 6743
South Boundary of the SE 1/4 of the NE 1/4
SW Corner of Section 16, Township 32 South, Range 21 East Found 1" Iron Pipe
SE Corner of Section 16, Township 32 South, Range 21 East Found Railroad Spike
SE Corner of the SW 1/4 of Section 16, Township 32 South, Range 21 East. Found PK & Disc Stamped LS 2347
Fence End E 0.6 of Boundary Line
Fence Line S 0.7 of Boundary Line
Fence Corner E 36.5 of Boundary Line
Fence Corner E 7.4
Fence Corner E 1.1
Fence in Poor Condition W 6.2 of Boundary Line
Fence in Poor Condition W 3.5 of Boundary Line
Fence Line E 3.0 of Boundary Line
Fence Line E 6.7 of Boundary Line
Fence Line E 2.0 of Boundary Line
Fence Line E 0.4 of Boundary Line
Fence Line E 20.6 of Boundary Corner
Fence Corner S 11.8, E 12.6 of Boundary Corner
Fence Corner SE 42.0 of Boundary Line
Fence Line E 20.7 of Boundary Corner
Fence Corner S 1/4
Found 4" Round CM
Found 5/8 CIR Stamped LB 6743
Found PK Nail & Disc Stamped LB 6992
Found PK Nail & Disc Stamped LB 6922
Found Railroad Spike
Found 4x4 CM
Found 1 1/4 Iron Rod
Found 1" Iron Pipe
Found Railroad Spike
Structures
S89°43'52"E 492.85
S89°28'09"E 3555.26
S89°27'51"E 2698.90
S89°28'57"E 2695.48
S89°17'37"E 1349.37
S89°29'26"E 1341.56
S89°18'33"E 2697.48
S89°18'33"E 2682.56
N89°18'33"W 670.64
N87°26'08"W 654.94
S84°23'23"W 364.65
S77°41'54"W 585.12
S70°52'28"W 325.32
N00°36'18"E 265.77
S30°05'42"W 309.20
S56°40'26"W 632.78
S51°47'01"W 302.02
S39°45'50"W 232.09
S32°25'26"W 252.28
S38°41'30"W 246.65
S16°33'21"W 276.07
S10°21'44"E 279.42
S00°37'09"E 207.16
S16°35'06"E 49.40
S82°46'53"E 775.99
S73°43'22"E 809.10
N89°30'09"W 2699.84
S89°30'09"E 2699.84
N00°13'07"E 2599.69
N00°13'07"E 1330.17
N00°13'07"E 1329.52
N00°13'07"E 1330.17
N00°14'45"E 1334.63
N00°14'45"E 1283.42
N00°13'07"E 1329.76
N00°13'07"E 1048.39
N00°36'18"E 1331.89
N00°36'18"E 1066.12
N00°24'32"E 1334.42
S00°26'40"W 1334.01
N00°47'52"E 2684.58
N00°44'52"E 2675.47
N00°44'52"E 2675.47
N00°44'52"E 2440.07
N00°44'52"E 2675.47
N00°22'37"E 2666.40
S00°13'07"W 53.37
S56°40'26"W 632.78
S30°05'42"W 237.55
S51°47'01"W 214.65
S51°47'01"W 302.02
S51°47'01"W 232.09
S39°45'50"W 232.09
S32°25'26"W 252.28
S32°25'26"W 252.27
S38°41'30"W 246.65
S38°41'30"W 246.64
S16°33'21"W 276.07
S16°33'21"W 276.05
S00°37'09"E 207.16
S00°37'09"E 207.15
S10°21'44"E 279.42
S10°21'44"E 279.40
S16°35'06"E 49.40
S16°35'06"E 256.39
110.41
670.78
1341.28
1349.24
1349.25
1230.87
1341.28
1349.24
1283.42
1334.63
1329.76
1048.39
1331.89
1066.12
1334.42
1334.01
1330.17
1329.52
1330.17
1330.17
1330.17



Line Table		
Line #	Length	Direction
L14	105.89	S00°44'52"W
L15	451.04	N89°30'09"W
L16	13.80	N00°44'52"E
L17	140.16	N89°42'58"W
L18	540.30	N89°11'06"W

Line Table		
Line #	Length	Direction
L19	172.75	N89°55'22"W
L20	321.83	N89°29'13"W
L21	374.38	N89°01'30"W
L22	245.97	N88°58'09"W

Line Table		
Line #	Length	Direction
L23	29.37	N00°00'00"E
L24	587.26	N89°29'48"W
L25	28.04	S00°00'00"E
L26	31.31	N88°55'47"W

Line Table		
Line #	Length	Direction
L27	165.27	N89°21'11"W
L28	471.84	S89°27'58"W
L29	99.90	N89°49'45"W
L30	13.56	S00°47'52"W

ALTA/NSPS LAND TITLE SURVEY
FOR
MOSAIC FERTILIZER LLC
OF
PORTION OF SECTION 16, TOWNSHIP 32 SOUTH, RANGE 21 EAST, HILLBOROUGH COUNTY, FLORIDA

Prepared by:
KENDRICK LAND SURVEYING, LLC
Florida Registration No.8541
KLS
Post Office Box 191
1615 N. Park Ave
Bartow, Florida 33831
(863) 533-4874

LEGEND

*	= CALCULATED CORNER
o	= SET 5/8" IRON ROD WITH CAP STAMPED LB 8541 UNLESS OTHERWISE NOTED
5/8" OR	= 5/8" IRON ROD WITH CAP STAMPED
⊡	= FOUND CONCRETE MONUMENT
CM	= CONCRETE MONUMENT
(NO ID)	= NO IDENTIFICATION
MRW	= MAINTAINED RIGHT-OF-WAY LINE
N	= NORTH/NORTHING
E	= EAST/EASTING
○	= POWER POLE
(00)	= TITLE COMMITMENT EXCEPTION NUMBER
———	= BOUNDARY LINE
— — —	= SECTION LINE
— — —	= TOP OF BANK
— — —	= MAINTAINED RIGHT-OF-WAY LINE
—OHV—	= OVERHEAD WIRE
-x-x-x-	= BARB WIRE FENCE
	= DIRT ROAD
	= PAVEMENT
	= CONCRETE
◎	= WELL
F	= FIBER OPTIC MARKER

REVISIONS

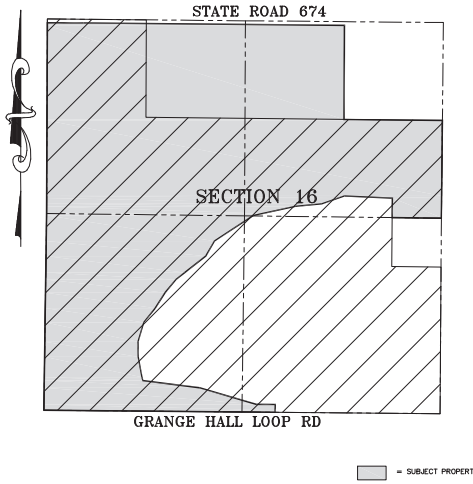
NO.	DATE	DESCRIPTION	BY:
1	3/19/24	ADDED ENTITY TO CERTIFICATION	JCB

SCALE	VARIES
DRAWING NO.	24-4601A
DRAWN BY	JCB
CHECKED BY	JCB
DATE OF SURVEY	3/18/24
REFER TO	W04601

SHEET 2

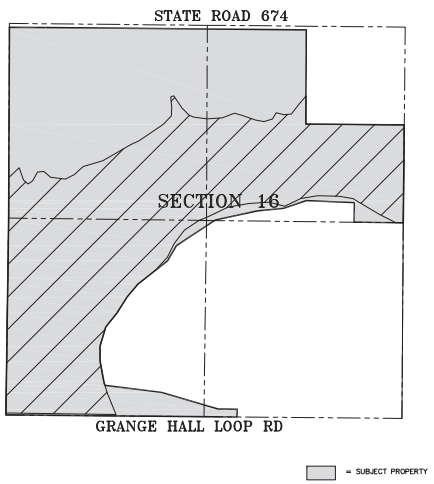
TITLE EXCEPTION No. 5

= Exception No. 5



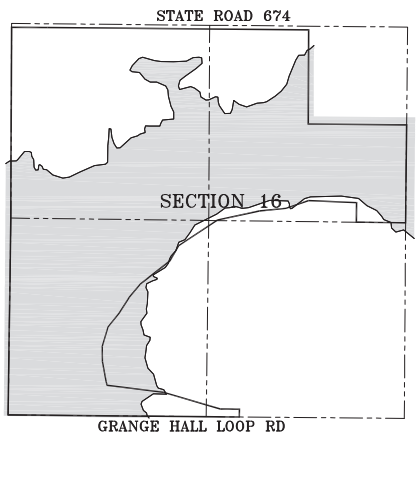
TITLE EXCEPTION No. 12

= Exception No. 12 (O.R. Book 14171, Page 631)



DETAIL OF FEMA FLOOD ZONE "AE"

= Flood Zone "AE" according to Flood Insurance Rate Map Number 12057C0705H, Community Hillsborough County, Panel Number 120112, dated August 28, 2008.



TITLE EXCEPTIONS:

I have reviewed the STEWART TITLE GUARANTY COMPANY, Commitment No. 2024010021 effective date January 11, 2024. *And all encumbrances, except liens, as identified in Schedule B, Part II of said commitments have been shown on the survey and/or noted.*

TITLE EXCEPTIONS AFFECTING THE SUBJECT PROPERTY AND SHOWN ON MAP.

Item 2c: Structures encroaching along the East boundary of the NW 1/4 of the NE 1/4 & Ditches along the South boundary of the E 1/2 of the SE 1/4 of the NE 1/4.

Item 5: Any grant or grants of oil, gas, and minerals that may be shown by the public records with respect to the SE 1/4 of SE 1/4, and that does not or do not exceed an undivided one-half interest in the aggregate, and that expressly excludes or does not pertain to sand, clay, limestone, dolomite, flint, and phosphate on or near the surface to a maximum of depth of 150 feet, as recorded in Warranty Deed Official Records Book 3494, Page 480, of the Public Records of Hillsborough County, Florida.

Item 12: Declaration of Perpetual Conservation Easement for the benefit of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida, as more fully set forth in the document recorded in **Official Records Book 14171, Page 631**, together with First Amendment to Declaration of Perpetual Conservation Easement recorded in Official Records Book 23889, Page 414, of the Public Records of Hillsborough County, Florida.

Item 14: Easement granted to Tampa Electric Company, as more fully set forth in the document recorded in Official Records Book 10883, Page 180, of the Public Records of Hillsborough County, Florida (See Sheet 1).

TITLE EXCEPTIONS AFFECTING ALL THE SUBJECT PROPERTY AND NOT SHOWN ON MAP.

Item 6: Terms, conditions and restrictions as more fully set forth in the Deed recorded in Official Records Book 5175, Page 1971, of the Public Records of Hillsborough County, Florida.

Item 7: Solid Waste Collection Franchise issued under Hillsborough County Ordinance 72-1, including terms and conditions thereof, as recorded in Official Records Book 5548, Page 1776, of the Public Records of Hillsborough County, Florida.

Item 8: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 7737, Page 1738, of the Public Records of Hillsborough County, Florida.

Item 9: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 8195, Page 341, of the Public Records of Hillsborough County, Florida.

Item 10: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 8824, Page 1405, of the Public Records of Hillsborough County, Florida.

Item 11: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 10433, Page 1199, of the Public Records of Hillsborough County, Florida.

Item 13: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 14893, Page 667, of the Public Records of Hillsborough County, Florida.

Item 15: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 18585, Page 1157, of the Public Records of Hillsborough County, Florida.

Item 16: Long Term Restoration Agreement, including terms and conditions thereof, as recorded in Official Records Book 20037, Page 881, of the Public Records of Hillsborough County, Florida.

Item 17: Approval and Mitigation Agreement, including terms and conditions thereof, as recorded in Official Records Book 20529, Page 1930, of the Public Records of Hillsborough County, Florida.

Item 18: Long Term Restoration Agreement, including terms and conditions thereof, as recorded in Official Records Book 22594, Page 488, of the Public Records of Hillsborough County, Florida.

Item 19: Notice of Adoption of a Development Order Amendment for Hillsborough County Mines Development of Regional Impact Hillsborough County, including terms and conditions thereof, as recorded in Official Records Book 26310, Page 1974, of the Public Records of Hillsborough County, Florida.

Item 20: Notice of Adoption of the Amended Composite Development Order and Operating Permit (DRI #263), including terms and conditions thereof, as recorded in Official Records Book 27055, Page 368, of the Public Records of Hillsborough County, Florida.

TITLE EXCEPTIONS: Continued

TITLE EXCEPTION NOT AFFECTING THE SUBJECT PROPERTY AND NOT SHOWN ON MAP.

Item 12: Declaration of Perpetual Conservation Easement for the benefit of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida, as more fully set forth in the document recorded in Official Records Book 14171, Page 631, together with First Amendment to Declaration of Perpetual Conservation Easement recorded in **Official Records Book 23889, Page 414**, of the Public Records of Hillsborough County, Florida.

TITLE EXCEPTION WITH NO DESCRIPTION IN DEED DOCUMENT.

Item 21: Resolution R23-095, including terms and conditions thereof, as recorded in Official Records Instrument 2023514992, of the Public Records of Hillsborough County, Florida.

Note: O.R. Book, page shown in bold letters are the pertinent deeds affecting the exception containing multiple deed listings.

800 0 400 800

Scale 1"=800'

ALTA/NSPS LAND TITLE SURVEY
FOR
MOSAIC FERTILIZER LLC
OF
PORTION OF SECTION 16, TOWNSHIP 32 SOUTH, RANGE 21 EAST, HILLBOROUGH COUNTY, FLORIDA

Prepared by:
KENDRICK LAND SURVEYING, LLC
Florida Registration No.8541
KLS
Post Office Box 191
1615 N. Park Ave
Bartow, Florida 33831
(863) 533-4874

LEGEND

◆	= CALCULATED CORNER	———	= BOUNDARY LINE
o	= SET 5/8" IRON ROD WITH CAP STAMPED LB 8541 UNLESS OTHERWISE NOTED	- - - -	= SECTION LINE
5/8" CIR	= 5/8" IRON ROD WITH CAP STAMPED	— — —	= TOP OF BANK
⊡	= FOUND CONCRETE MONUMENT	— — —	= MAINTAINED RIGHT-OF-WAY LINE
CM	= CONCRETE MONUMENT	—OHV—	= OVERHEAD WIRE
(NO ID)	= NO IDENTIFICATION	—x—x—	= BARB WIRE FENCE
N	= NORTH/NORTHING		= DIRT ROAD
E	= EAST/EASTING		= PAVEMENT
○P	= POWER POLE		= CONCRETE
(00)	= TITLE COMMITMENT EXCEPTION NUMBER	⊛	= WELL
		Ⓕ	= FIBER OPTIC MARKER

REVISIONS

NO.	DATE	DESCRIPTION	BY:
1	3/19/24	ADDED ENTITY TO CERTIFICATION	JCB

SCALE	1"=800'
DRAWING NO.	24-4601B
DRAWN BY	JCB
CHECKED BY	JCB
DATE OF SURVEY	3/18/24
REFER TO	W04601

SHEET 3

EXHIBIT F

Exhibit F

The following is a tabulation of Permits that were active during the reporting period:

ACTION *	AGENCY	PERMIT NO.	PURPOSE
Water Use Permits			
C	SWFWMD	2011400.033	For All Mosaic land
Surface Water Discharge Permits			
C	FDEP	FL0036412	FCO - NPDES Discharge Permit
C	FDEP	FL0033332	LSM - NPDES Discharge Permit
Domestic Wastewater Permit			
C	FDEP	FLA012623	FCO - Domestic Wastewater Permit
Air Permits			
C	FDEP	1050034-028-AO	Air Operating Permit
Drinking Water System			
C	DHRS	6293070	FCO - Drinking Water System- Plant
C	DHRS	6296253	FCO - Drinking Water System- Annex
Radioactive Materials License			
C	DHRS	3841-1	All - Radioactive Materials License
Dredge & Fill Permits			
C	FDEP	292018519	LSM- MU 14 D & F
C	ACOE	199500794 (IP-ML)	FCO - Minewide
C	FDEP	0155875-005	FCO - Regional Permit
C	FDEP	128272001-DF	FCO - Bridging Area
C	ACOE	199500794	FCO - Bridging Permit
		(IP-ML) (MOD 3)	FCO - MU # 10&11E
		(IP-ML) (MOD 2)	FCO – MU 12E Utility Corridor
		(IP-CS) (MOD 11)	FCO/FTG Utility Corridor
C	ACOE	2008782(NW-MGH)	Hurrah Creek Outfall
C	ACOE	199905366(IP-CS)	FCO Regional Permit
C	FDEP	0155875-001	FCO - Wetland V
C	FDEP	0155875-038	FCO - Surface Tract
C	ACOE	2013-01258	LSM - MU 21A
C	FDEP	0155875-084	LSM - MU 21A SWERP
C	ACOE	19904414	LSM – LMR Miles Grove/The Lake
C	ACOE	91NW-41177	LSM – Hurrah Creek
C	FDEP	0155875-139 GP	FCO - Hurrah Creek Fencing
C	FDEP	142476-063 NGP	FCO to FTG DL Xing
C	FDEP	0155875-148 ERP	LSM - MU 13
C	FDEP	291997143 WRP	LSM - Hurrah Creek
C	FDEP	0155875-014 WRP	FCO - LMR Temp. DL Crossing O
C	FDEP	0035468-001-E1 ERP	FCO - MU8 Expansion
C	FDEP	0155875-021 WRP	LSM – Miles Grove, MU 14

* A - Applied for; C - Continued in effect; C&A - Continued in effect, Applied for modification; O - Obtained; D – Denied; CL - Closed

C	FDEP	01254999-001 WRP	FCO - MU 12E Access Corridor
C	FDEP	0155875-025 ERP	FCO -Hurrah Creek Outfall
C	FDEP	0155875-061 ERP	FCO - MU 20E Carlton Corridor
C	FDEP	0133996-001 WRP	KFD - MU R
C	ACOE	0133996-004 WRP	KFD - MU T
C	FDEP	291117409 WRP	KFD – Lake Branch
C	FDEP	291739679 WRP	KFD – MU K
C	FDEP	0133996-104 NGP	KFD – K-7 Repair
C	FDEP	0133996-095 NGP	KFD – Non-Mandatory Program
C	ACOE	199200024(IP-ML)	KFD – MU T
C	ACOE	199603173(IP-CS)	KFD – Kingsford Plant Site
C	ACOE	199603173(IP-ML)	KFD – MU R
C	ACOE	199402903(IP-ML)	KFD – South Bradley Junction
C	ACOE	199402902(IP-ML)	KFD – West Kingsford
C	ACOE	199200291(IP-IL)	KFD – North Bradley Junction
C	ACOE	90IPF-00027(IP-BL)	KFD – Boggy Branch, MU K
C	ACOE	199200024(NWP-WDD-13i)	KFD – KC-SPA-13i Connection Repair
C	ACOE	199200024(NWP-WDD-13ii)	KFD – KC-SPA-13ii Connection Repair

Hills. Co. Mining Units (including EPC approvals)

C	HPGMD	991.13P	LSM – MU 13
C	HPGMD	602.10P	LSM – MU 14
C	HPGMD	197.01P	LSM - MU 15
C	HPGMD	702.12P	LSM - MU 16
C	HPGMD	804.05P	LSM - MU 17
C	HPGMD	696.05P	FCO - MU 13
C	HPGMD	1199.10P	FCO - MU 12E
C	HPGMD	598.03P	FCO - MU 14E
C	HPGMD	1298.12P	FCO - MU 15E
C	HPGMD	698.04P	KFD - MU R
C	HPGMD	1298.11P	KFD - MU T
C	HPGMD	402.03P	KFD - MU K
C	HPGMD	1192.20P	KFD - MU P
C	HPGMD	400.04P	FCO - MU 16E
C	HPGMD	301.09P	FCO - MU 17E
C	HPGMD	101.03P	FCO - MU 18E
C	HPGMD	802.15P	FCO - MU 19E
C	HPGMD	210.01P	LSM - MU 18
C	HPGMD	1106.01P	LSM - MU 19
C	HPGMD	1208.12P	LSM - MU 19A
C	HPGMD	408.03P	LSM - MU 20
C	HPGMD	610.04P	FCO - MU 20E
C	HPGMD	711.03P	LSM - MU 21
C	HPGMD	312.01P	LSM - MU 22
C	HCDS	813.05P	LSM - MU 21A
C	EPC	MAIW #78166	KFD-SPA-13i Connection Repair
C	EPC	MAIW #78164	KFD-SPA-13ii Connection Repair

* A - Applied for; C - Continued in effect; C&A - Continued in effect, Applied for modification; O - Obtained; D – Denied; CL - Closed

Setback Waivers

C	HPGMD	695.07P	FCO - Taylor Rd. Setback Waiver
C	HPGMD	1192.20P	FCO - MU 7 - Setback Waived 2-22-95
C	HPGMD	1298.11P	KIN - MU T
C	HPGMD	1298.12P	FCO - MU 15E
C	HPGMD	702.12P	LSM - MU 16 setback waiver
C	HPGMD	804.05P	LSM - MU 17 setback waiver
C	HPGMD	1106.01P	LSM - MU 19 setback waiver
C	HPGMD	610.04P	FCO - MU 20E setback waiver
C	HPGMD	711.03P	LSM - MU 21
C	HPGMD	312.01P	LSM - MU 22
C	HCDS	813.05P	LSM - MU 21A
C	HCDS	DRI 23-0119	LSM - MU 13 SR 674 setback waiver
C	HCDS	123.01P	LSM - MU 13 CR 39 setback waiver

Clay Pond Construction

C	FDEP	FCO - FL0036412-IW1S/RA - Settling Pond F-5 construction	
C	FDEP	FL0032522	LSM - Settling Pond L-1 construction
C	FDEP	FCO - FL0036412-027	Settling Pond F-7 construction
C	FDEP	FL003332	LSM - Settling Pond L-2 construction
C	HPGMD	1010.09P	LSM - Settling Pond L-2 construction
C	FDEP	FL003332-016	LSM - Settling Pond L-3 construction
C	HCDS	314.02P	LSM - Settling Pond L-3 construction

General Wildlife Relocation

C	FFWCC	LSNR-20-00216	Migratory Bird Nest Removal (typically osprey's)
C	FFWCC	GTC-19-00286	Gopher Tortoise Conservation - mine wide
C	USFWS	ES 051429-9	FCO/LSM Fl. Scrub Jay capture / tag / translocate
C	USFWS	00-171a	Biological Opinion (Scrub Jay, Indigo Snake, Bald Eagle)
C	USFWS	MB101068-0	Scientific Collecting (take, transport, possess or salvage – burrowing owls, eagles, or other non-listed migratory birds)
O	FFWCC	PLSIT-24-0001	Programmatic Southeastern American Kestrel Permit
C	USFWS	MB37878B-4	Regional Migratory Bird Permit

Other Wildlife Permits

C	FFWCC	LSSC-14-00079	MU 21 & 22 Burrowing Owl Translocations (Scientific Collecting)
C	FFWCC	LSNR-14-00160	Migratory Nest Removal (Burrowing Owl)
C	FFWCC	GTLR-13-00004B	Gopher Tortoise Recipient Site
C	FFWCC	GTC-19-0028A6	Capture and Relocate Gopher Tortoise
C	FFWCC	GTLR-22-00001	Gopher Tortoise Recipient Site

* A - Applied for; C - Continued in effect; C&A - Continued in effect, Applied for modification; O - Obtained; D – Denied; CL - Closed

EXHIBIT G

EXHIBIT G
SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS

CONDITION No.	CONDITION SUMMARY	STATUS
LIFE AND TIMING OF DEVELOPMENT		
A.1. [All][DRI 263]	Development Order effective until December 31, 2027.	Noted *(The comment "Noted" is used for all cases where implementation of the condition is to take place in the future, the situation that triggers the condition has not taken place, or Mosaic is addressing the issue on a routine basis with no specific response warranted.)*
AIR QUALITY		
B.1. [Consol][DRI 263]	Any proposed change that could have negative air quality impacts must be mitigated to assure compliance with applicable laws.	No changes to development proposed.
B.2. [Consol][DRI 263]	Number and location of air and surface water monitoring stations may be changes by EPC or Mosaic.	No changes have been requested to date.
B.3. [Ext.]	Measure to reduce erosion and fugitive dust to be implemented.	Noted
B.4. [Ext.]	If proposed change to project is S/D, County shall determine if change or re-analysis of air source is needed.	Noted
B.5 [DRI 263]	BMPs shall be employed during site preparation, mining and reclamation to minimize air quality impacts.	Noted. This is standard operating procedure (SOP)
WATER MANAGEMENT AND SUPPLY - GROUND WATER		
C.1. [All[DRI 263]	Water use shall not exceed SWFWMD permitted amount. Mosaic to copy PGMD on any permit modifications.	Water use is in compliance with the SWFWMD permit. There were no changes to the water use permit this past year for activities in Hillsborough County.
C.2. [L-85]	MOSF shall implement water quality measures referenced in the Application on pgs. 15-56 through 15-58 for parcels A, B & C.	Parcels A, B has been mined and reclaimed. The Parcel C has been mined and no future mining is planned. Reclamation in Parcel C is planned for 2027 with ongoing discussion with Hillsborough County staff on timing updates. EPCHC has approved updated mitigation plan for LMU 19 on 10/27/2023 of which Parcel C is a portion. There is currently no mitigation in Parcel C on this recently approved mitigation plan.

EXHIBIT G
SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS

CONDITION No.	CONDITION SUMMARY	STATUS
C.3. [All][DRI 263]	All wells shall be maintained, operated, or plugged per SWFWMD regulations.	Noted. All on-site wells requiring abandonment are permitted according to applicable SWFWMD regulations.
C.4 [EXT][ADD][DRI 263]	If requested by the County, FDEP, or SWFWMD, groundwater quality monitoring program shall be instituted.	County requested addition of stream stage monitoring. The recordings are included.
C.5. [FC-1]	Production wells to be sampled for water quality monthly & reported quarterly.	This information was sent to the County.
C.6 [FC-1]	Pumpage records for each production well to be sent to county quarterly.	This information was sent to the County.
C.7 [FC-1]	Water level will be provided by SWFWMD ROMP # 40 wells.	This information is available from SWFWMD web site: http://www.swfwmd.state.fl.us/waterlevel/welall/. Look for site # 368, 370 & 371.
C.8. [DRI 263]	Only as applied to Parcel One, MOSF's mining activities shall not breach the clay confining unit, and in no event shall contact with the limestone aquifer be allowed.	Noted.
WATER MANAGEMENT - SURFACE WATER		
D.1. [FC-1]	Correct operation of control structures and surface water flows required per regulations.	Condition met. This is SOP.
D.2. [K-31]	Donate 300 acres for county water reservoir.	An offer to donate 300 acres was made to Hillsborough County and was declined.
D.3. [EXT][DRI 263]	Erosion control measures such as siltation screens and hay bales shall be used to prevent surface water quality degradation.	Noted. BMP procedures have been implemented and are followed.
D.4. [EXT][ADD][DRI 263]	No degradation of water quality standards by stormwater exiting the site. If agency requires, monitoring will be done.	No stormwater from mine area is allowed to leave the site, except through DEP/EPA NPDES permitted outfalls. All required monitoring is performed and will continue on the approved sampling schedule.
D.5. [ALL][DRI 263]	Base flow to Alafia and Little Manatee & tributaries shall be documented by USGS stations, and not adversely altered by mining/reclamation.	This information is published annually by SWFWMD/USGS. This data shows that the mining has had no adverse impact on the base flow.

EXHIBIT G
SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS

CONDITION No.	CONDITION SUMMARY	STATUS
D.6. [ALL][DRI 263]	All stormwater runoff from active mine area shall be released only through NPDES points.	Noted. This is SOP.
	SOILS	
E.1. [ALL]	Natural top soils should be used in reclamation.	This is SOP for new reclamation areas where feasible.
E.2. [EXT]	Soil conservation measures referenced in ADA to be implemented.	This is SOP for new mine operation & reclamation areas.
E.3. [DRI 263]	BMPs shall be employed during site preparation.	This is SOP.
	WETLANDS	
F.1.A. [All]	All future mining and reclamation plans submitted to the County to show preservation and conservation areas per TBRPC policies, including wildlife corridors.	Noted. See Mining Unit (MU) Applications.
F.1.B. [DRI 263]	Those areas which meet the definition of preservation and conservation areas, unless vested, shall be identified in the application for approval of "Mining and Mining Related Activities".	Noted. See MU Applications.
F.2. [ALL]	For construction and operation of mine access corridors and clay settling areas: A. Wetland mitigation on 1:1 ratio required. B. Wetland delineation and mitigation plan to be approved by EPC. C. EPCHC to assist in crossing site selection. D. EPCHC has approved the shapes and configurations of L-2, L-3, L-4, F-5, F-7, and F-8 clay settling areas. E. A minimum or 9,096 acres of clay settling area is approved. F. ACOE & FDEP dredge & fill permits to be obtained prior to wetland disturbance.	Crossing "O" has been permitted and built according to these requirements. All other future crossings and clay settling areas will meet these requirements. A. Noted. B. Noted. C. Noted. D. Noted. F-8 CSA will not be constructed. E. Noted. F. Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
F.3. [DRI 263]	Impacts to EPCHC/FDEP jurisdictional wetlands for parcels 4-8 must be mitigated pursuant to Ch. 62C-16, 62-343 and 62-345, F.A.C. and Ch. 1-11, Rules of the EPC.	Noted. This is addressed in the MU approval process.
F.4 [EXT]	Pursuant to TBRPC policy 10.3.1, in the mining unit applications, there shall be no mining in preservation areas.	Noted. No mining has occurred in the preservation areas.
F.5. [EXT]	For the portion of the LMR that is currently and OFW, the associated adjoining natural forested communities shall be preserved in their entirety.	Noted.
F.6. [EXT][ADD]	Mining in the Additional Areas and the Ext. Area shall not adversely impact TBRPC defined preservation areas.	Noted.
F.7. [EXT][ADD][DRI 263]	There shall be no adverse hydroperiod alteration on the plans submitted to Hillsborough County & FDEP. Historic annual hydroperiods, normal pool elevation and normal seasonal high water elevation shall be maintained.	Noted.
F.8. [EXT][ADD][DRI 263]	Mosaic shall provide a natural buffer according to the requirement of the County LDC, around all preservation areas. A. Allowable wetland losses to be require a minimum 1:1 replacement. B. Permitted wetland impact area to be used as donor material for reclamation. C. Mitigation areas and littoral shelves to be designed, implemented and monitored per EPC & FDEP requirements.	Noted. A. Noted. B. Noted. C. Noted.
FLOODPLAINS		
G.1. [ALL][DRI 263]	There shall be no mining within the 25-year floodplain. Mining within the 100-year floodplain is not prohibited.	Noted. No mining has occurred within the 25-year floodplain.
G.2. [DRI 263]	There shall be no net loss of the 100-year floodplain storage capacity.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
STREAM AND RIVER CROSSINGS		
H.1. [ALL][DRI 263]	Site specific plans for each 25-year floodplain and wetland crossing shall be included in the mining unit application.	Noted.
H.1.A. [ALL][DRI 263]	Crossings shall be scheduled for base or low water-flow periods and shall be conducted in accordance with BMPs.	Noted.
H.1.B. [ALL][DRI 263]	Crossings and culverts shall be designed to handle the 100-year flood event.	Noted.
H.1.C. [ALL][DRI 263]	The removal of vegetation shall be minimized. Clearing width for dragline crossings shall be limited to 175 to 200 feet and the length and width of each crossing shall be specified.	Noted.
H.1.D. [ALL] [DRI 263]	Fill material used in the wetlands for the crossings shall be clean sand.	Noted.
H.1.E. [ALL][DRI 263]	Fill material required for the crossing shall be placed no sooner than three days before the crossing and removed within two days after the crossing. The crossing shall be restored without delay to the original grade elevations and permanently re-vegetate the area.	Noted.
H.1.F. [All][DRI 263]	Siltation control devices shall be used in the streams/wetlands as needed.	Noted.
H.1.G. [ALL][DRI 263]	Pipelines shall be jacketed, placed above the 100-yr. floodplain pursuant to and as mapped by the approved DRI 213 and isolated from tributaries by berms.	Noted.
H.1.H. [All][DRI 263]	All utility crossings shall be elevated above the 25-year floodplain pursuant to and as mapped by the approved DRI 213, and shall consist of piers without any approach embankment.	Noted.
H.1. I. [ALL][DRI 263]	Each crossing shall require an FDEP permit, with the SWFWMD, EPCHC, and TBRPC receiving copy of the application.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
H.2. [ALL][DRI 263]	Additional stream crossings or crossing of tributaries at locations other than those described in the Applications shall be cause for a substantial deviation determination.	Noted.
H.3 [CONSOL][DRI 263]	The applicant shall not use floodplain crossings A, B and I or wetland crossings 5, 6, 10, and 12 for mine operations.	Noted.
H.4 [ALL]	No clay transfer pipeline crossings of the 25-yr floodplain or wetlands in route to clay settling areas shall be allowed within the Consolidation Phase, except for 25-yr floodplain crossings I (Hurrah Creek) and J (Alderman) and at wetland crossing 12 (Hurrah Creek) or 4.	Noted.
H.5. [EXT][DRI 263]	MOSF shall document to Hills. Co., in mining unit applications, that 25-yr floodplain and wetland crossings are necessary.	Noted.
H.6. [EXT][DRI 263]	MOSF shall be provided access to all areas approved for mining by the DO.	Noted.
H.7. [EXT]	All 25-yr floodplain and wetland crossings in S33 and 34, Twn. 32S, Rng. 21E, must be submitted for approval in the same application.	Noted.
H.8. [EXT][DRI 263]	If any 25-yr floodplain or wetland crossings occur in the Additional Acreage or Ext. Area, recommended Mining Operations conditions iii.Q.13.D shall apply	Noted.
VEGETATION AND WILDLIFE		
I.1. [FC-1]	BMP for revegetation, forestation & erosion control shall be used.	This is SOP.
I.2. [FC-1]	BMP shall be used to accelerate natural development of forested and unforested wetland vegetation.	This is SOP.
I.3. [FC-1]	Reclamation shall not be considered complete until vegetation associations are established and will fully develop.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
I.4. [L-85][DRI 263]	A program to protect rare, endangered or threatened species such as capture-relocation programs and/or recreation of appropriate habitat shall be implemented by MOSF.	Noted.
I.5. [ALL][DRI 263]	In event listed species frequent site for nesting, feeding, or breeding, proper measures shall be taken.	Noted.
I.6. [EXT][K-120][DRI 263]	Relocation of gophers is alternative if accepted by FFWCC.	Permits are obtained from FFWCC for gopher tortoise relocations as required. See listing of permits.
I.7.A. [CONSOL][DRI 263]	MOSF shall participate in a Hillsborough County Wildlife corridor protection program. Post-mining wildlife corridors and xeric habitats identified in this program shall be in addition to the FRCRPP policy preservation areas.	Following the mine reclamation plan is the means by which Mosaic will increase the wildlife corridor section on site. Mosaic management personnel also served on the Hillsborough County Greenways Advisory Committee. Mosaic's donation of the land in the Little Manatee River Corridor is the fulfillment of this condition.
I.7.B. [EXT][DRI 263]	MOSF shall participate, in conjunction with the FFWCC, the U.S. Fish and Wildlife Service and Hillsborough County, in a wildlife corridor protection program.	See response above.
I.8. [EXT][DRI 263]	MOSF to utilize and abide by USFWS & FFWCC species guidelines as defined by Habitat and Wildlife Management Plan (Appendix D).	Noted.
I.9. [EXT][DRI 263]	Mosaic to use BMPs to establish the landforms, uses and natural vegetation in the reclamation plans.	Noted.
I.10. [EXT][DRI 263]	Mining Unit Plans to include conditions which ensure maintenance and where feasible, increase in listed species.	Noted.
I.11. [EXT][DRI 263]	Mosaic to perform pre-clearing wildlife surveys for the purpose of locating for mitigation (relocation) according to Habitat & Wildlife Management Plan, 6 mo. prior to clearing.	Noted. This is done at the time of the MU application.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
I.12 [EXT][DRI 263]	Habitat and Wildlife Management will: A. Continue existing range management of controlled burning on 2 to 4 year cycle in the palmetto prairie and xeric areas. B. Clearing to be done in directional method. C. Reclamation of habitat to be staged to maintain total of 50% of habitat on site. D. Bald Eagles and nest to be protected according to USFWS & FFWCC rules.	Noted. A. Noted. B. Noted. C. Noted. D. Noted. Protective measures are in place in areas of active mining.
I.13 [EXT][DRI 263]	Mining unit application submittals to include sub-basin plans, to show total ecosystem context.	Noted.
I.14 [EXT][DRI 263]	Mining and disturbance of significant wildlife habitat shall be according to 3.8 & 3.9 LDC. Status of habitat re-establishment to be included in Annual Report.	Mitigation is planned to occur in stages and is ongoing, see attached maps and monitoring reports.
I.15 [EXT][DRI 263]	Significant habitat to be field verified at the time of mining unit approval.	Noted.
I.16 [EXT][DRI 263]	Mining Unit application to show that mining activities are not fragmenting wildlife corridors.	Noted.
I.17 [EXT][DRI 263]	Upon adoption of Hillsborough County Mining Reclamation Manual, all restoration and re-establishment shall be in accordance with the success criteria of the manual.	Noted.
I.18. [EXT][ADD][DRI 263]	As possible, relocated population of listed wildlife to be as large after relocation as before, & viable.	Noted.
I.19. [DRI 263]	Existing wetlands which are permitted to be altered or eliminated shall be used as donor material for revegetation or mitigation to the greatest extent practicable.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
I.20 [DRI 263]	Existing agricultural activities on the site may continue until the area is prepared for mining, but at no greater density or intensity than at present.	Noted.
I.21. [DRI 263]	Mining Unit applications will include a survey of the current status of threatened and endangered plants and animals in those areas indicated to be of possible concern in the ADA.	Noted.
I.22. [DRI 263]	The areas of regionally significant habitat within the DRI 263 Addition Area Phase shall be protected in perpetuity.	Noted.
ARCHAEOLOGICAL AND HISTORIC RESOURCES		
J.1. [All]	Any historical or archaeological resources discovered shall be immediately reported to DHR, and all disturbance of site stopped until DHR determines site requirements.	No new sites have been discovered during this reporting period.
J.2. [ALL]	Sites to be excavated prior to impact are:8Hi3791, 8Hi3792, 8Hi3794, 8Hi3795, 8Hi3797, 8Hi3801, 8Hi3804, 8Hi3817 & 8Hi3824, 8Hi3868. Documentation of release to be provided in annual report.	Noted. Site 8Hi3795 “pole barn” has been moved and the site released. Sites 8Hi3792 and 8Hi3797 have been released.
J.3. [DRI 263]	If historical or archeological sites are discovered within the DRI 263 Addition Area Phase, the FDHR shall evaluate the significance of such findings and assess the measures which will be taken to avoid, minimize, or mitigate any adverse impacts prior to continuation of mining activities.	Noted. FDHR will be notified in the event potential significant sites are located.
EMERGENCY RESPONSE & FIRE PROTECTION		
K.1 [ALL][DRI 263]	Mosaic shall continue to meet or exceed federal, state & local fire codes.	Noted.
K.2 [EXT][DRI 263]	Mosaic shall continue to maintain effective communication with the Hills. Co. Fire Rescue Dept. to assure immediate paramedic assistance, including Medevac response if necessary.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
SOLID WASTE AND HAZARDOUS WASTE		
L.1 [ALL][DRI 263]	Mosaic is encouraged to utilize waste exchanges and develop on-site treatment capabilities.	Noted.
L.2 [ALL][DRI 263]	Mosaic shall provide employees with information on type of waste, handling, & regulations.	This information is available at all operational locations.
L.3 [ALL][DRI 263]	Underground storage of hazardous or toxic materials is prohibited.	Noted.
L.4 [ALL][DRI 263]	MOSF shall comply with all applicable regulations on hazardous material and wastes.	Noted.
L.5 [K-120]	Solid wastes shall be collected, transported and disposed according to terms the Hillsborough County Ord.	All solid wastes are collected at plant sites in appropriate containers, removed and disposed by licensed Contractors according to Federal, State, and County regulations.
L.6 [DRI 263]	There shall be no increased wastewater generation in excess of the currently permitted volume as it pertains to the mining of the DRI 263 Addition Area Phase.	Noted.
ENERGY CONSERVATION		
M.1. [CONSOL][DRI 263]	Energy Conservation measures are encouraged.	Mosaic employs electrical engineers to develop, review, and promote energy conservation measures throughout our operations.
EQUAL OPPORTUNITY		
N.1 [K-120][DRI 263]	Developer to encourage contractor to involve minority groups.	This is SOP.
DRAINAGE		
O.1. [FC-1]	After reclamation is completed in each drainage basin, floodplains are to be determined.	No action required to date.
O.2. [FC-1]	If peak discharge increases over premining, additional retention will be added to reduce peak.	This condition is dependent on O.1. above. No action required to date.
O.3. [FC-1]	Upon completion of reclamation, all floodplains and wetlands will be subject to rules and regulation in effect.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
O.4. [L-85]	Parcels B & C reclamation to restore drainage basin to same size.	Parcel B reclamation is completed, and reclamation is complete. Parcel C has been mined and no future mining is planned. Reclamation in Parcel C is planned in 2027 with ongoing discussions with Hillsborough County staff on timing updates. .
O.5. [K-120]	Mining Unit Drainage plans to be reviewed by TBRPC, and approved by SWFWMD & Hills. Co.	Noted.
O.5.A. [EXT][DRI 263]	Stormwater runoff and stream discharges from active mining areas shall not cause violation of Class III water quality standards in the receiving stream.	Noted.
O.5.B. [EXT][DRI 263]	MOSF shall be responsible for maintaining the drainage system including channels, culvert and erosion protection facilities. Any transfer of this responsibility from MOSF to subsequent owners shall require the approval of Hills. Co. and/or SWFWMD.	Noted.
O.5.C. [CONSOL]	BMPs for reducing adverse water quality impacts, as recommended by Hills. Co. and SWFWMD shall be implemented.	Noted.
O.6. [ALL][DRI 263]	The post-reclamation peak flow to meet Hills. Co. & SWFWMD requirements.	Noted.
TRANSPORTATION		
P.1. [K-120]	No private access to be interrupted unless adequate alternative is provided.	Noted.
P.2. [K-120]	MOSF shall be held responsible for any damage caused by MOSF to public streets or roads used for mining activities as reasonably determined by the Hills. Co. Public Works Dept., Engineering Division.	Noted.
P.3. [ALL]	FDOT monitoring of highways structural condition to be provided to TBRPC, and County. If accelerated structural degradation occurs, Mosaic shall enter into agreement to pay proportionate share of improvement cost.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
P.4. [ALL][DRI 263]	Mosaic shall not use SR 674 between U.S. 301 and I-75 to transport product by truck. The approved alternate haul route, subject to weight restrictions, is SR 674 to Balm Wimauma Rd. to SR 672 in lieu of the proposed haul route through Sun City Center, as shown on the map "Approved Truck Haul Routes" July 21, 1993, as amended.	Noted.
P.5. [ALL][DRI 263]	Any proposed change to haul routes shall require S/D determination.	No changes have been proposed.
P.6. [CONSOL]	When mine & plants are at maximum capacity, Mosaic to provide peak-hour daily traffic counts to verify traffic projections.	Traffic counts were completed as part of DRI #263.
MINING OPERATION		
Q.1. [ALL][DRI 263]	The total area disturbed and unreclaimed shall not exceed 14,622 acres (not including access corridors).	Noted.
Q.2. [ALL][DRI 263]	The Board approved the amended Mining and Reclamation Plan as shown on Table 38A-2, subject to the requirement that all mining be completed by 2018, and all reclamation by Dec. 31, 2026.	Noted.
Q.3. [FC-2A]	Tailing Area A & B approved for 550 acres, and wetlands impacted to be mitigated on 1:1 basis.	The tailing at these sites has been moved and the site mined. Wetland mitigation is included in MU 7.
Q.3. [CONSOL][FC-2A]	Settling Pond F-2 to have maximum area of 2750 acres, and reclamation started by 1998, and completed by 2011.	The F-2 CSA complex is made of (4) CSAs (F-2A, F-2B, F-2C and F-2D) and total ~ 2,466 acres, which is below the maximum acres identified On November 7, 2023, (Section 2. Conditions: A.) the Board of County Commissioners re-authorized clay deposits from Hardee County in the Hillsborough County Clay Settling Areas (CSA), the CSA will be utilized to its full design storage capacity or until November 15, 2028, unless extended by the Board of County Commissioners. This CSA will remain active and delay reclamation until each CSA is utilized to its full design or until November 15, 2028.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
Q.4. [ALL][DRI 263]	No disturbance of preservation areas shown on Map H-7. No disturbance of wetland until EPC or FDEP review and mitigation plan approval obtained.	Preservation areas (floodplains) have and will not be disturbed except at approved crossing sites. Wetland mitigation plans will be obtained prior to disturbance.
Q.5. [L-85]	No mining in stream in northern part of parcel B.	This area was protected while the adjoining part of parcel B was mined and reclaimed. No further activity is planned in this area.
Q.6. [L-85]	Mosaic shall meet setback requirements of County Ord. and SWFWMD WUP.	Noted.
Q.7. [ALL][DRI 263]	Cumulative rate of mining shall not exceed 10% or 11 acres, whichever is greater, of schedule shown on Table 38A-2 without County approval.	Noted. The total area mined (matrix) through June 30, 2025 is 31,290.3
Q.8. [K-120][DRI 263]	If MOSF elects to amend the approved Mining and Reclamation Schedule as shown on Table 38A-2, MOSF shall submit amendments to HCPGMD for review and approval.	Noted.
Q.9. [K-120][DRI 263]	Mining & Reclamation plans to include: a. Preservation of 25 Yr. floodplain, and restoration of forest areas. b. Toe spoiling of all overburden containing matrix or leach material.	Noted.
Q.10. [K-120]	Developer to comply with all condition of Mining and Reclamation plan, County Ord. 87-27, and all other applicable rules.	Noted.
Q.11. [K-120][DRI 263]	This DO is intended to control future mining and mining related activities in the Consolidation, Extension Phases, and DRI 263 Addition Area Phase. All activities shall be consistent with the current LDC unless determined to be vested.	Noted.
Q.12. [ALL][DRI 263]	Mosaic shall continue all existing monitoring requirements. Changes to monitoring will require County and affected agency approval.	Monitoring is continuing in accordance with the scheduled approved by PGMD in 2002.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
Q.13. [ALL][DRI 263]	**Mining Unit plans to include**: A. Preservation of 25 yr. floodplain, restoration of forested wetland along 100 yr. floodplain, no impervious surfaces in 25 yr. floodplain crossings, and S/D determination for any new wetland or floodplain crossings. B. Allowable wetland impacts to be mitigated at 1:1 in kind replacement, wetland soil used as donor material in reclamation. C. Maintain same watershed size and locations. D. Provide positive protection against any significant leaks, discharge to outside containment area. Routine inspection of all pipes, and systems shut down if spill occurs.	Noted. This is SOP.
Q.14. [ALL][DRI 263]	All setback variances must be specifically approved by County BOCC.	Noted. See table in the text section of this annual report for status.
Q.15. [ALL]	All dams or embankments that impound water are to be designed and maintained according to Ch. 62-672 F.A.C. Inspections and maintenance to be as described on page 38E-15 of ADA.	Noted. This is SOP.
Q.16. [ALL]	The clay stored in F-1 are approved to be moved to F-2.	Noted.
Q.17. [CONSOL][DRI 263]	Clay settling area L-2 & L-3 locations includes preservation and conservation areas. Appropriate mitigation will be required.	Noted. This was addressed in the MU 16 & 17 applications.
Q.18. [ALL][DRI 263]	Any additional clay settling area will require S/D determination.	Noted.
Q.19. [EXT]	Clay settling areas shall not be built on unmined areas.	Noted.
Q.20. [EXT]	Mosaic shall develop a contingency plan for each waste clay settling pond, to be filed with the dam construction permit application.	Noted. This is part of FDEP permitting process.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
Q.21. [EXT]	Mosaic will provide sufficient copies of Mining Unit plans for TBRPC & SWFWMD review of wetland impacts, control of exotic species, scheduling of mitigation, and cumulative acres of wetlands preserved, altered, mined & recreated.	Noted. The copies are provided to these agencies by Hillsborough County as part of the review process.
Q.22. [EXT]	D.O. recognizes Mosaic's continued use of area for agricultural operations until area is used for mining.	Noted.
Q.23. [DRI 263]	During the course of the S/D review, MOSF shall ensure all critical locations are provided alternative energy sources for the pumps during the hurricane season to assure the appropriate control of the water within the recirculation/containment systems.	Noted.
RECLAMATION		
R.1 [L-85]	Reclamation of mined areas to be completed within 3 years on each parcel.	Parcels A & B are reclaimed. Parcel C has been mined and no future mining is planned. Reclamation in Parcel C is planned for reclamation in 2027 with ongoing discussions with Hillsborough County staff on timing updates.
R.2 [L-85]	Reclamation for parcels B & C to be approved by EPC.	This is part of MU review procedure. Parcel B has been released by EPC. Parcel C has been mined and no future mining is planned. Reclamation in Parcel C is planned for reclamation in 2027 with ongoing discussions with Hillsborough County staff on timing updates. EPCHC has approved updated mitigation plan for LMU 19 on 10/27/2023 of which Parcel C is a portion. There is currently no required mitigation in Parcel C on this recently approved mitigation plan.
R.3 [L-85]	Parcel B to include 1:1 reclamation of sand pine scrub community.	This reclamation is completed.
R.4 [L-85]	Lake littoral zone to use mulching techniques.	No lakes are planned for [L-85] area.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
R.5. [K-120]	Reclamation plans to include: a. 1:1 replacement of hardwood forest. b. Maintenance of existing watersheds. c. Pasture areas to include 10% forest for wildlife. d. MOSF to maintain all reclaimed areas to DEP & County rules. e. Implement mitigation measures on pg.22-10.	These conditions have been and will continue to be recognized in the MU applications.
R.6. [ALL][DRI 263]	Reclamation to be according to 16C-16, F.A.C., and County rules.	This is SOP.
R.7. [ALL][DRI 263]	Mosaic to clean up site and remove all structures that are not be put to allowable use per FDEP reclamation regulations.	This is SOP.
R.8. [ALL][DRI 263]	Amendment to solely stay in compliance with 16C-16, F.A.C. are presumed not to be a S/D. Mosaic shall amend DRI, if FDEP amendments are significant, to assure consistency.	Noted. No amendment has been required to date.
R.9. [ALL][DRI 263]	Deeds to land shall disclose if the parcel was mined.	Noted. No mined land has been sold to date.
R.10. [ALL][DRI 263]	New mining and reclamation procedures developed by USBM, FIPR, etc. to lessen adverse environmental impact are to be implemented, and are presumed not to be a S/D.	Noted.
R.11. [EXT][DRI 263]	Mosaic shall continue to comply with DHRS rules and procedures for radioactivity soils.	Noted.
R.12. [EXT][DRI 263]	Until reclamation or mitigation areas are released, Mosaic shall control exotic species per rules/permit conditions.	Noted.
R.13. [EXT][DRI 263]	All reclaimed lakes & wetlands to have water quality comparable to natural systems.	Noted.
GENERAL CONDITIONS		
S.1. [ALL][DRI 263]	Annual Report.	This report is in response to this condition. See main report section for details.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
S.2. [ALL][DRI 263]	Provide copy of County annual progress report to TBRPC, along with all monitor data.	Monitoring Data Appendix attached to TBRPC & DCA copy.
S.3. [ALL][DRI 263]	Mosaic to encourage small business, and non-discriminatory employment.	Noted.
S.4. [ALL][DRI 263]	No capital improvement costs shall accrue to the County due to this project.	There will be no capital improvement cost to the County as a result of this project.
S.5. [ALL]	Any change to project that departs from the information that is shown in the latest tables figures and maps as identified in the 6th A.I. addenda shall require a S/D determination.	Noted.
S.6. [EXT]	All Mining Units within the Extension area to be numbered to distinguish them from the Consolidation Phase area.	Noted. An “E” is being added to the MU number to indicate that the Unit is in the Extension area.
S.7. [DRI 263]	Any approval of Hills. Co. Mine Consolidation S/D shall satisfy the provisions of 380.06 (15), F.S. and the following provisions of the FAC: Rule 9J-2.041; Rule 9J-2.043; Rule 9J-2.044; and Rule 9J-2.0252.	Noted.
S.8. [DRI 263]	Payment for any future activities of the TBRPC with regard to this development, including enforcement actions, shall be paid to the TBRPC by MOSF in accordance with Rule 9J-2.0252.	Noted.
S.9. [DRI 263]	All provisions contained within the Application shall be considered conditions of this DO unless inconsistent with the terms and conditions of this DO, in which case the terms and conditions of this DO shall control.	Noted.
S.10. [DRI 263]	This DO shall be binding. It is understood that any reference herein to any govt. agency shall be construed to mean any future instrumentality which may be created or designated as successors in interest to any branch of government or governmental agency.	Noted.

EXHIBIT G SUMMARY STATUS OF DEVELOPMENT ORDER CONDITIONS		
CONDITION No.	CONDITION SUMMARY	STATUS
S.11. [DRI 263]	Should the changes to pre-mining, mining or post-mining scenarios depart significantly from the schedules and methods described in the ADA or meet the criteria set forth in Subsection 380.06(19), F.S., the project will be subject to a S/D determination.	Noted.
WATER QUALITY, WATER SUPPLY AND STORMWATER MANAGEMENT		
T.1. [DRI 263]	Crossing O is also designated as a pipeline crossing point for water pipes and slurry pipes.	Noted.
T.2. [DRI 263]	Mine use of these existing crossings (N, K, L, P, 13, 14 and 21) was approved by DRI 213. The exact justification for any remaining tributary crossings will be done at the time of the future mining unit approvals.	Noted.
T.3. [DRI 263]	All existing wells which have no future use or attempted wells or test foundation holes shall be cement plugged by the firm of a licensed water well contractor (under SWFWMD Well Abandonment Permit(s)).	Noted.
T.4. [DRI 263]	There shall be no net increase in the public water demand in excess of the currently permitted volume as of 2006 as it pertains to the mining of the DRI 263 Addition Area Phase.	Noted.
T.5. [DRI 263]	As committed, MOSF shall implement the following measures to avoid potential adverse impacts upon ground and surface water hydrology and water quality on, beneath, and downgradient of the DRI 263 Addition Area Phase: Maintenance of Water Table Elevations; Stream Flows; and Water Quality.	Noted.
T.6. [DRI 263]	In order to ensure the protection of water resources, water table measurements shall continue to be taken on a weekly basis or as required by SWFWMD.	Noted.

EXHIBIT H

EXHIBIT H
EXTERNAL DISTRIBUTION LIST

Ms. Kim Cruz — 1 Copy of Report
Environmental Supervisor
Hillsborough County Environmental Services
332 N. Falkenburg Road
Tampa, Florida 33619

Mr. Jeffry Greenwell — 1 Copy of Report
Section Manager
Public Utilities Department
332 N. Falkenburg Road
Tampa, Florida 33619

Mr. James Stansbury — 1 Copy of Report
Department of Economic Opportunity
Bureau of Community Planning
170 E Madison St
Tallahassee, FL 32399-2100

Mr. Scott Rogers — 1 Copy of Report
Department of Economic Opportunity
Bureau of Community Planning
107 East Madison St.
Tallahassee, FL 32399-2100

Ms. Cara Martin — 1 Copy of Report
Government and Community Affairs
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899

Mr. Lance Kautz — 1 Copy of Report
Environmental Consultant
Florida Department of Environmental Protection
Southwest District
13051 N. Telecom Parkway
Temple Terrace, Florida 33637

Ms. Marisa Rhian — 1 Copy of Report
Program Administrator
Department of Environmental Protection
2001 Homeland Garfield Rd.
Bartow, FL 33830

Ms. Zachariah Shely — 1 Copy of Report
Environmental Administrator
Department of Environmental Protection
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

Ms. Jackie Langston — 1 Copy of Report
Environmental Specialist II
Department of Environmental Protection
2001 Homeland Garfield Rd.
Bartow, FL 33830

Mr. Jerry Harding — 1 Copy of Report
Water Use Evaluation and Compliance Manager
Southwest Florida Water Management District
7601 US HWY 301 North
Tampa, Florida 33637

EXHIBIT H
INTERNAL DISTRIBUTION LIST

Russell Schweiss — 1 Copy of Report
Senior Director, Land and Resource Strategies

Aaron Flint — 1 Copy of Report
Senior Manager, Operations

Laura Morris — 1 Copy of Report
Superintendent Permitting and Reclamation and Compliance

Shelley Thornton — 1 Copy of Report
Sr. Manager Mine Permitting

Lauren Brooks — 1 Copy of Report
Senior Environmental Counsel I

Lisa Lannon — 1 Copy of Report
Superintendent Reclamation

Chuck Pons — 1 Copy of Report
Ecologist III

File Copy — 1 Copy of Report

EXHIBIT I

Exhibit I

Following is a table showing the setback waivers approved to date, and the cumulative acres affected.

HILLSBOROUGH COUNTY
CUMULATIVE SETBACK WAIVERS

SETBACK LOCATION	PERMIT NO.	ACRES WAIVED
LSM – Mining Unit 13 - CR 39	123.01P	9.6
LSM - Mining Unit 13 - SR 674	N/A	12.0
LSM - Mining Unit 14 - SR 674	890.21P	12.0
FCO - Mining Unit 6 - Taylor Rd.	690.15P	19.0
FCO - Mining Unit 7 - Taylor Rd.	695.07P	6.0
FCO - Mining Unit 6 - Taylor Rd.	1295.12P	48.0
FCO - Mining Unit 10 - Taylor - Gill Rd.	895.09P	34.0
FCO - Mining Unit 11E - Taylor - Gill Rd.	1295.11P	34.0
FCO - Mining Unit 9 - Shuman amend.	1295.12P	10.0
FCO - Mining Unit 8 - Taylor Rd.	690.17P	29.5
FCO - Mining Unit 13 - Taylor Rd., SR 674 & Taylor Gill Rd.	696.05P	122.6
FCO - Mining Unit 12 E. - CR 39	797.15P	20.2
KFD - Mining Unit S	1096.13P	39.0
KFD - Mining Unit T	1298.11P	36.0
FCO - 14E	1298.12P	43.0
FCO - MU 16E	400.04P	17.5
KFD - MU R - Walter Hunter Road	698.04P	23.0
KFD - MU R - Amend. - Adj. Property Owner Consent	999.08P	24.0
FCO - MU 14E - Taylor Gill Rd.	300.01P	20.0
FCO - MU 15E - Colding Property	201.06P	24.1
FCO - MU 17E	301.09P	83.8
KFD - MU T - Albritton Rd.	101.02P	50.1
FCO - MU 19E	802.15	5.9
LSM MU 16 - CR 39	702.12	3.9

LSM MU 17 - SR 674	804.05	14.7
LSM MU 19	1106.11	71.8
LSM MU 18	210.01P	23.8
LSM MU 20E	610.04P	114.5
LSM MU 21	711.03P	295.4
LSM MU 22	312.01P	266.1
LSM MU 21A	813.05P	6.7
LSM MU 13	123.01P	9.3
TOTAL		**1529.5**

EXHIBIT J

Gopher Tortoise Conservation

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Division of Habitat and Species Conservation
Wildlife Diversity Conservation Section
620 South Meridian Street, Mail Station 2A
Tallahassee, Florida 32399-1600
(850) 921-1031

Permittee Name:	Mosaic Fertilizer LLC	Permit Number:	GTC-24-00472
Permittee Address:	13830 Circa Crossing Drive LITHIA, FLORIDA 33547 UNITED STATES	Effective Date: Expiration Date:	10/31/2024 10/31/2029

Agent Name:	Edward Murawski
Agent Address:	Kleinfelder 1907 North US Highway 301 Suite 100 TAMPA, FLORIDA 33619 UNITED STATES

IS AUTHORIZED TO:

- Capture, transport and relocate all gopher tortoise (*Gopherus polyphemus*) hatchlings less than or equal to 60 mm carapace length (CL), gopher tortoises greater than 60 mm CL by non-harmful means and to molest, damage or destroy gopher tortoise burrows while conducting these activities, subject to the following conditions and provisions, in association with development activities at the following site.

Total number of gopher tortoises authorized: 2,079

Authorized Capture Methods:

1. Capture gopher tortoises using bucket traps
2. Capture gopher tortoises using hand shovel excavation of gopher tortoise burrows
3. Mark captured gopher tortoises
4. Release gopher tortoises at recipient sites
5. Supervise backhoe excavation of gopher tortoise burrows to capture gopher tortoises
6. Authorized to burrow scope

AUTHORIZED LOCATION(S):

22737.95-acre Mosaic 5 Year Gopher Tortoise Conservation Permit Project Site
(Latitude 27° 38' 55.4" N Longitude 82° 2' 15" W), City LITHIA, County HILLSBOROUGH

Off-site relocation

Recipient Site Name: Fort Green (FG-HC-10/11/12)
Unit Name: FG-HC-10/11/12 - Reserved Tortoise Capacity: 1018
(Latitude 27° 35' 2.37" N Longitude 82° 2' 22.68" W), Counties HARDEE
Authorized under permit GTLR-14-00004B

Recipient Site Name: Mosaic Wellfield
Unit Name: Mosaic Wellfield North - Reserved Tortoise Capacity: 394
(Latitude 27° 28' 16.27" N Longitude 82° 12' 5.33" W), Counties MANATEE
Authorized under permit GTLR-14-00005B

Recipient Site Name: Mosaic Wellfield South(Tier1)
Unit Name: Mosaic Wellfield South - Reserved Tortoise Capacity: 667
(Latitude 27° 28' 2.21" N Longitude 82° 12' 8.95" W), Counties MANATEE
Authorized under permit GTLR-22-00001

Permittee Signature: _____ Date: 11/1/2024

Not valid unless signed. By signature, confirms that all information provided to issue the permit is accurate and complete, and indicates acceptance and understanding of the provisions and conditions listed below. **Any false statements or misrepresentations when applying for this permit may result in felony charges and will result in revocation of this permit.**

Authorized By: Claire Blunden Authorized for: Melissa Tucker, Division Director

Authorizing Signature: Claire Singer Blunden Date: 10/31/2024

Wildlife Diversity Conservation Section

PERMIT CONDITIONS AND PROVISIONS:

1

Authorization to conduct the specified activities in association with the relocation of gopher tortoises in Florida is subject to Rule 68A-9.002 and Chapter 68A-27, Florida Administrative Code (F.A.C.), and the Florida Fish and Wildlife Conservation Commission's (hereafter, "FWC") Gopher Tortoise Permitting Guidelines (April 2008 - revised September 2012) [hereafter, "Permitting Guidelines"],
the Restated and Amendment Memorandum of Agreement Regarding Gopher Tortoises on Mosaic Land (June 18, 2015), as amended [hereafter, MOA], and is subject to the following provisions/conditions. Where the MOA and the Guidelines are in conflict, the terms of the MOA shall control.

Authorized activities are also predicated and conditioned on the information and assurances provided in the 06/07/2024 application (as supplemented), the assurances of which are herein incorporated by reference.

2

Authorized activities are also predicated and conditioned on the information and assurances provided in the Permittee's 03/08/2019 application (as supplemented), the assurances of which are herein incorporated by reference.

3 During colder months, tortoises shall only be captured and relocated when the low temperature at the recipient site is forecasted by the National Weather Service (www.weather.gov) to be above 50° F for three consecutive days [72 hours] after release (including the day of relocation). This three-day window of milder temperatures is required to allow the relocated tortoises to settle into the recipient site and reduce the chance of cold-related stress or mortality. If capturing tortoises using bucket traps, the Permittee shall cover all traps on days forecasted to be below 50° F. The 28 consecutive day trapping period must restart at day 1 when a trap is closed for any reason.

4 Captured gopher tortoises that show signs of disease (i.e., nasal and ocular discharge, emaciation, etc.) shall not be relocated off
site to the authorized recipient site. At the Permittee's discretion, symptomatic tortoises may be: relocated on-site; transported to and quarantined at a FWC-licensed wildlife rehabilitation center (list available upon request) for treatment and subsequent relocation of recovered, non-symptomatic gopher tortoises along with others from the population; transported and donated to a FWC-permitted disease research program; or humanely euthanized by a licensed veterinarian when disease is advanced.

5 Gopher tortoise capture and relocation activities may be conducted only if written local government approvals have been obtained for land clearing, grading, or construction activities and provided to the Gopher Tortoise Program Coordinator (via the FWC online permit system or via email to GTPermits@MyFWC.com) prior to commencing relocation activities.

6 This permit can be suspended, revoked or not renewed for just cause pursuant to 68-1.010, F.A.C. and Chapter 120, Florida Statutes. It is non-transferable and must be readily available for inspection at all times while engaging in the permitted activities.

7 The activities authorized under this Permit must be carried out by the Authorized Gopher Tortoise Agent("Authorized Agent") designated on this permit, or under the direct supervision and responsibility of that Authorized Agent. The Permittee and Authorized Agent shall be as fully responsible for any such activities to the same extent as if they had themselves carried out those activities under this Permit.

8 The Authorized Agent shall conduct a gopher tortoise burrow survey covering 100% of the tortoise habitat within the donor site area from which gopher tortoises will be relocated, and shall notify the FWC and provide the survey results in accordance with Section 7.c of the MOA.

9 The Permittee shall notify the Gopher Tortoise Program Coordinator by uploading the notice to the FWC online permit system, by email at GTPermits@MyFWC.com, or by phone at (850)921-1031 at least 24 hours (excluding weekends and holidays) before initiating the tortoise relocation effort.

10 Either this original permit, or a complete copy, must be clearly posted at the affected site at all times while engaged in the permitted tortoises relocation activities, and should remain posted until construction activities are completed.

11 Any gopher tortoise mortality or injury that occurs while conducting activities authorized under this permit shall be reported to the Gopher Tortoise Program Coordinator (by phone at 850-921-1031 or by email to GTPermits@MyFWC.com) within 48 hours of the occurrence. An injured gopher tortoise shall be promptly taken to either a licensed wildlife rehabilitation facility or a licensed veterinarian for evaluation and treatment. Contact information for the facility or veterinarian shall be included with the information reported.

12 The Permittee, by signing this permit, specifically agrees to allow authorized FWC personnel, upon presentation of credentials as may be required by law, access to the donor and recipient sites, at reasonable times, for the purpose of inspecting the capture/relocation activities authorized under this permit.

13 The Permittee shall submit a report detailing the capture and relocation activities via the FWC online permit system within 30 days of the release of the captured/relocated tortoises. An after action report checklist is attached for use in that regard. Any request for permit renewal or extension should be submitted at least 45 days prior to the expiration date of this permit.

14 Nonnative wildlife that are members of the families Pythonidae, Boidae, Varanidae, Iguanidae and Teiidae captured during gopher tortoise relocation activities shall be euthanized in accordance with the requirements of the Permitting Guidelines. Authorized Agents are authorized to transport conditional species for purposes of euthanasia in accordance with the transport requirements in the Permitting Guidelines. All other non-native wildlife captured should be humanely euthanized or allowed to escape on-site. Sightings of Burmese pythor, Argentine tegu, or other nonnative wildlife species should be reported to the FWC within 48 hours by either calling the toll-free number 1-888-IVEGOT1 (1-888-483-4681) or online at www.IveGot1.org.

15 Gopher tortoise commensals listed in 68A-27 F.A.C. as State-designated threatened species and encountered in the gopher tortoise capture operation should either be released on-site or allowed to escape unharmed, or be donated to an educational or research facility that possesses the appropriate FWC scientific collecting/educational use permit and is authorized to receive additional specimens of the captured species. Non-listed native commensals should either be allowed to escape unharmed or released on-site. Refer to Appendix 9 of the Permitting Guidelines for additional information on gopher tortoise commensals. If you have questions regarding handling/releasing gopher tortoise commensals encountered during capture operations, contact the Gopher Tortoise Program Coordinator's office by calling 8509211031.

16 This permit does not authorize the take of Federally-designated Endangered and Threatened species. Only individuals who are in possession of a valid permit or authorization issued by the United States Fish and Wildlife Service (USFWS) to capture or possess an eastern indigo snake or other Federally-designated Endangered and Threatened species may physically handle those species. If individuals without a USFWS permit or authorization encounter an eastern indigo snake during attempts to capture gopher tortoises or during subsequent land alteration or development activities within the property, all movement of heavy equipment and land alteration or development activities within the vicinity of the snake shall cease to allow the snake to vacate the area. No movement of heavy equipment, or land alteration or development activities within the vicinity of the snake shall resume until the snake has vacated the work area.

17 This permit does not authorize Permittee access to any public or private properties. Permission to access the property must be secured from the appropriate landholders prior to undertaking any work on such properties.

A person whose substantial interests are affected by FWC's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. A person seeking a hearing on FWC's action shall file a petition for hearing with the agency within 21 days of receipt of written notice of the decision. The petition must contain the information and otherwise comply with

section 120.569, Florida Statutes, and the uniform rules of the Florida Division of Administration, chapter 28-106, Florida Administrative Code. If the FWC receives a petition, FWC will notify the Permittee. The attached Explanation of Rights statement provides additional information as to the rights of parties whose substantial interests are or may be affected by this action.

Gopher Tortoise Conservation

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Division of Habitat and Species Conservation
Wildlife Diversity Conservation Section
620 South Meridian Street, Mail Station 2A
Tallahassee, Florida 32399-1600
(850) 921-1031

Permittee Name:	Mosaic Fertilizer LLC	Permit Number:	GTC-24-00472
Permittee Address:	13830 Circa Crossing Drive LITHIA, FLORIDA 33547 UNITED STATES	Effective Date: Expiration Date:	10/31/2024 10/31/2029

Agent Name:	Edward Murawski
Agent Address:	Kleinfelder 1907 North US Highway 301 Suite 100 TAMPA, FLORIDA 33619 UNITED STATES

IS AUTHORIZED TO:

- Capture, transport and relocate all gopher tortoise (*Gopherus polyphemus*) hatchlings less than or equal to 60 mm carapace length (CL), gopher tortoises greater than 60 mm CL by non-harmful means and to molest, damage or destroy gopher tortoise burrows while conducting these activities, subject to the following conditions and provisions, in association with development activities at the following site.

Total number of gopher tortoises authorized: 2,079

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4. Release gopher tortoises at recipient sites
5. Supervise backhoe excavation of gopher tortoise burrows to capture gopher tortoises
6. Authorized to burrow scope

AUTHORIZED LOCATION(S):

22737.95-acre Mosaic 5 Year Gopher Tortoise Conservation Permit Project Site
(Latitude 27° 38' 55.4" N Longitude 82° 2' 15" W), City LITHIA, County HILLSBOROUGH

Off-site relocation

Recipient Site Name: Fort Green (FG-HC-10/11/12)
Unit Name: FG-HC-10/11/12 - Reserved Tortoise Capacity: 1018
(Latitude 27° 35' 2.37" N Longitude 82° 2' 22.68" W), Counties HARDEE
Authorized under permit GTLR-14-00004B

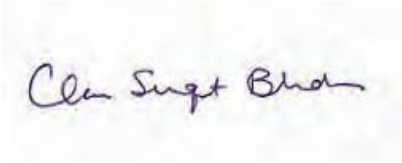
Recipient Site Name: Mosaic Wellfield
Unit Name: Mosaic Wellfield North - Reserved Tortoise Capacity: 394
(Latitude 27° 28' 16.27" N Longitude 82° 12' 5.33" W), Counties MANATEE
Authorized under permit GTLR-14-00005B

Recipient Site Name: Mosaic Wellfield South(Tier1)
Unit Name: Mosaic Wellfield South - Reserved Tortoise Capacity: 667
(Latitude 27° 28' 2.21" N Longitude 82° 12' 8.95" W), Counties MANATEE
Authorized under permit GTLR-22-00001

Permittee Signature: _____ Date: _____

Not valid unless signed. By signature, confirms that all information provided to issue the permit is accurate and complete, and indicates acceptance and understanding of the provisions and conditions listed below. **Any false statements or misrepresentations when applying for this permit may result in felony charges and will result in revocation of this permit.**

Authorized By: Claire Blunden Authorized for: Melissa Tucker, Division Director



Authorizing Signature: _____ Date: 10/31/2024

Wildlife Diversity Conservation Section

PERMIT CONDITIONS AND PROVISIONS:

1

Authorization to conduct the specified activities in association with the relocation of gopher tortoises in Florida is subject to Rule 68A-9.002 and Chapter 68A-27, Florida Administrative Code (F.A.C.), and the Florida Fish and Wildlife Conservation Commission's (hereafter, "FWC") Gopher Tortoise Permitting Guidelines (April 2008 - revised September 2012) [hereafter, "Permitting Guidelines"],
the Restated and Amendment Memorandum of Agreement Regarding Gopher Tortoises on Mosaic Land (June 18, 2015), as amended [hereafter, MOA], and is subject to the following provisions/conditions. Where the MOA and the Guidelines are in conflict, the terms of the MOA shall control.

Authorized activities are also predicated and conditioned on the information and assurances provided in the 06/07/2024 application (as supplemented), the assurances of which are herein incorporated by reference.

2

Authorized activities are also predicated and conditioned on the information and assurances provided in the Permittee's 03/08/2019 application (as supplemented), the assurances of which are herein incorporated by reference.

3 During colder months, tortoises shall only be captured and relocated when the low temperature at the recipient site is forecasted by the National Weather Service (www.weather.gov) to be above 50° F for three consecutive days [72 hours] after release (including the day of relocation). This three-day window of milder temperatures is required to allow the relocated tortoises to settle into the recipient site and reduce the chance of cold-related stress or mortality. If capturing tortoises using bucket traps, the Permittee shall cover all traps on days forecasted to be below 50° F. The 28 consecutive day trapping period must restart at day 1 when a trap is closed for any reason.

4 Captured gopher tortoises that show signs of disease (i.e., nasal and ocular discharge, emaciation, etc.) shall not be relocated off
site to the authorized recipient site. At the Permittee's discretion, symptomatic tortoises may be: relocated on-site; transported to and quarantined at a FWC-licensed wildlife rehabilitation center (list available upon request) for treatment and subsequent relocation of recovered, non-symptomatic gopher tortoises along with others from the population; transported and donated to a FWC-permitted disease research program; or humanely euthanized by a licensed veterinarian when disease is advanced.

5 Gopher tortoise capture and relocation activities may be conducted only if written local government approvals have been obtained for land clearing, grading, or construction activities and provided to the Gopher Tortoise Program Coordinator (via the FWC online permit system or via email to GTPermits@MyFWC.com) prior to commencing relocation activities.

6 This permit can be suspended, revoked or not renewed for just cause pursuant to 68-1.010, F.A.C. and Chapter 120, Florida Statutes. It is non-transferable and must be readily available for inspection at all times while engaging in the permitted activities.

7 The activities authorized under this Permit must be carried out by the Authorized Gopher Tortoise Agent("Authorized Agent") designated on this permit, or under the direct supervision and responsibility of that Authorized Agent. The Permittee and Authorized Agent shall be as fully responsible for any such activities to the same extent as if they had themselves carried out those activities under this Permit.

8 The Authorized Agent shall conduct a gopher tortoise burrow survey covering 100% of the tortoise habitat within the donor site area from which gopher tortoises will be relocated, and shall notify the FWC and provide the survey results in accordance with Section 7.c of the MOA.

9 The Permittee shall notify the Gopher Tortoise Program Coordinator by uploading the notice to the FWC online permit system, by email at GTPermits@MyFWC.com, or by phone at (850)921-1031 at least 24 hours (excluding weekends and holidays) before initiating the tortoise relocation effort.

10 Either this original permit, or a complete copy, must be clearly posted at the affected site at all times while engaged in the permitted tortoises relocation activities, and should remain posted until construction activities are completed.

11 Any gopher tortoise mortality or injury that occurs while conducting activities authorized under this permit shall be reported to the Gopher Tortoise Program Coordinator (by phone at 850-921-1031 or by email to GTPermits@MyFWC.com) within 48 hours of the occurrence. An injured gopher tortoise shall be promptly taken to either a licensed wildlife rehabilitation facility or a licensed veterinarian for evaluation and treatment. Contact information for the facility or veterinarian shall be included with the information reported.

12 The Permittee, by signing this permit, specifically agrees to allow authorized FWC personnel, upon presentation of credentials as may be required by law, access to the donor and recipient sites, at reasonable times, for the purpose of inspecting the capture/relocation activities authorized under this permit.

13 The Permittee shall submit a report detailing the capture and relocation activities via the FWC online permit system within 30 days of the release of the captured/relocated tortoises. An after action report checklist is attached for use in that regard. Any request for permit renewal or extension should be submitted at least 45 days prior to the expiration date of this permit.

14 Nonnative wildlife that are members of the families Pythonidae, Boidae, Varanidae, Iguanidae and Teiidae captured during gopher tortoise relocation activities shall be euthanized in accordance with the requirements of the Permitting Guidelines. Authorized Agents are authorized to transport conditional species for purposes of euthanasia in accordance with the transport requirements in the Permitting Guidelines. All other non-native wildlife captured should be humanely euthanized or allowed to escape on-site. Sightings of Burmese python, Argentine tegu, or other nonnative wildlife species should be reported to the FWC within 48 hours by either calling the toll-free number 1-888-IVEGOT1 (1-888-483-4681) or online at www.IveGot1.org.

15 Gopher tortoise commensals listed in 68A-27 F.A.C. as State-designated threatened species and encountered in the gopher tortoise capture operation should either be released on-site or allowed to escape unharmed, or be donated to an educational or research facility that possesses the appropriate FWC scientific collecting/educational use permit and is authorized to receive additional specimens of the captured species. Non-listed native commensals should either be allowed to escape unharmed or released on-site. Refer to Appendix 9 of the Permitting Guidelines for additional information on gopher tortoise commensals. If you have questions regarding handling/releasing gopher tortoise commensals encountered during capture operations, contact the Gopher Tortoise Program Coordinator's office by calling 8509211031.

16 This permit does not authorize the take of Federally-designated Endangered and Threatened species. Only individuals who are in possession of a valid permit or authorization issued by the United States Fish and Wildlife Service (USFWS) to capture or possess an eastern indigo snake or other Federally-designated Endangered and Threatened species may physically handle those species. If individuals without a USFWS permit or authorization encounter an eastern indigo snake during attempts to capture gopher tortoises or during subsequent land alteration or development activities within the property, all movement of heavy equipment and land alteration or development activities within the vicinity of the snake shall cease to allow the snake to vacate the area. No movement of heavy equipment, or land alteration or development activities within the vicinity of the snake shall resume until the snake has vacated the work area.

17 This permit does not authorize Permittee access to any public or private properties. Permission to access the property must be secured from the appropriate landholders prior to undertaking any work on such properties.

A person whose substantial interests are affected by FWC's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. A person seeking a hearing on FWC's action shall file a petition for hearing with the agency within 21 days of receipt of written notice of the decision. The petition must contain the information and otherwise comply with

section 120.569, Florida Statutes, and the uniform rules of the Florida Division of Administration, chapter 28-106, Florida Administrative Code. If the FWC receives a petition, FWC will notify the Permittee. The attached Explanation of Rights statement provides additional information as to the rights of parties whose substantial interests are or may be affected by this action.

NATIVE THREATENED SP. RECOVERY - THREATENED WILDLIFE;

Permit Number: ES051429

Version Number: 9

Effective: 2024-04-26 **Expires:** 2029-04-30

Issuing Office:

Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

ES Atlanta Permit Office
1875 Century Boulevard
Atlanta, Georgia 30345
permitsR4ES@fws.gov

Andy Devolder

Digitally signed by
Andy Devolder
2024-04-29 08:54:47

Permittee:

MOSAIC FERTILIZERS LLC
13830 CIRCA CROSSING DRIVE
LITHIA, FL 33547
US

Name and Title of Principal Officer:

Russell Schweiss Vice President, Land & Resource Strategies

Authority: Statutes and Regulations: 16 U.S.C. 1533 (d), 16 U.S.C 703-712 50 CFR 17.32, 50 CFR 21.23, 50 CFR 21.27, 50 CFR 13

Location where authorized activity may be conducted:

Hillsborough and Manatee Counties, Florida.

Reporting requirements:

Annual Reports are due by January 31 following each year that this permit is in effect.

Authorizations and Conditions:

A. General conditions set out in Subpart D of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accordance with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.

B. The validity of this permit is also conditioned upon strict observance of all applicable Foreign, State, Local, Tribal, or other Federal law.

C. The following individuals are authorized to conduct activities as authorized by this permit:

All activities: Raoul K. Boughton, Laura Currier, Anabel Lereculeur, Michael Newhouse, and Lee Walton.

All activities except radio-tagging and translocation: Charles Buckley and Katie Serba.

Trained assistants not named on this permit may work on permitted activities under the direct and on-site supervision of the individuals named above. However, trained assistants may not work independently at a site. All site investigators shall be trained in identification and handling techniques, advised on the laws and restrictions related to listed species, and apprised of permit conditions. The number of site investigators at any site shall be of an appropriate, manageable, size so that the permittee shall observe actions and prevent or limit harm to listed species and their habitats.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the terms of this permit and all sections of title 50 Code of Federal Regulations, Parts 13 and 17, pertinent to issued permits. Section 11 of the endangered species act of 1973, as amended, provides for civil and criminal penalties for failure to comply with permit conditions. In addition, the permittee shall have all other applicable Federal, Tribal, State, and/or local government permits prior to the commencement of activities authorized in this permit.

E. Permittee is authorized to take (capture, band, radio-tag, translocate, and collect blood) threatened Florida scrub-jays (*Aphelocoma coerulescens*) for the purpose of promoting the long-term viability of the Hillsborough/Manatee metapopulation, as described in permittee's March 9 2023, application and supplementary information submitted on February 7, 2024, and as conditioned below:

1. Adult and juveniles may be captured with mist nets or by non-harmful baited traps. Only unsalted peanuts may be used, in modest amounts, as bait. Permittee shall minimize disturbance to vegetation, especially near nests, when setting up nets and traps. Nets and traps must be continually attended.

2. Birds (adults, juveniles, and nestlings) may be banded with standard U.S. Geological Survey aluminum bands and plastic color bands.

3. Traps and mist nets must be continually attended and no captures should be left in traps.

4. All individuals must be immediately released after banding and examination, if they are not selected to be translocated

5. Before any color banding takes place, the permittee shall develop a coordinated marking scheme, approved by the USGS Patuxent Wildlife Research Center, Bird Banding Laboratory, 12100 Beech Forest Road, Laurel, Maryland 20708-4037; bbl@usgs.gov; telephone: 301/497-5790.

6. Florida scrub-jays selected for translocation shall be housed in a 0.46 x 0.61 x 0.91 m cage constructed out of one-half inch galvanized hardware cloth and fed a diet of high protein dog food, peanuts, and water.

7. Captive Florida scrub-jays shall be housed in arbitrary male - female pairs unless breeding pair bonds are already established.

8. Translocated Florida scrub-jays shall be held in the transport cage overnight and transferred at daylight to hacking cages located in restored areas of the Manatee Wellfield mitigation site.

9. The hacking cages shall be constructed out of 0.91 x 0.91 x 0.91 m, one-half inch galvanized hardware cloth placed on a 1.2m platform constructed out of 4-inch PVC pipe.

10. The captives shall be left in the hacking cages no longer than four to six days.

11. The feeders shall be phased out when the Florida scrub-jays are acclimated to the site.

12. Monitoring of Florida scrub-jays shall continue with daily visits during the first two weeks post-release and shall remain through the second breeding season past the last translocation to ensure acclimation to the site.

13. No more than two 12-meter (39.4-foot) mist nets per qualified person should be operational at any time.

14. The hands, clothing, and equipment used, or in contact with, *Aphelocoma coerulescens* during authorized activities must be disinfected between handling individual *Aphelocoma coerulescens*. Alcohol or other antiviral or bacterial solution should be used to wipe hands, clothing, and equipment that contact *Aphelocoma coerulescens*.

15. Nests and nest territories may be entered or inspected throughout the year. Inspections shall be conducted in such a manner as to minimize behavioral disturbances and minimize attraction of predators.

16. All nest visits and banding activities shall occur between 9:00 a.m. and 3:00 p.m.

17. If predators are observed near a nest at a scheduled visit, then the visit shall be postponed until the predator is absent.

18. Nests may be checked regularly to determine completed clutch size, the number of eggs that hatched, and the number of young that fledged.

19. If the laying date is known, additional visits are limited to six: a visit to determine final clutch size (5 days after the first egg was laid); a mid-incubation visit (day 9 to 10 of incubation); hatching, mid-nestling (day 6); nestlings (day 11); and, fledgling phase.

20. Each nestling may be measured, examined, weighed, and banded (see Condition E.2., above).

21. Nestlings shall be banded on day 11 after hatching, as follows:

i. Nestlings shall be carefully extracted from the nest by hand and the feet shall be carefully handled to disentangle the feet from the nest fibers.

ii. Each nestling to be banded shall be placed in a cloth bag and removed at least 10 meters from the nest for processing.

iii. If the parental birds are nearby and scolding, then peanuts shall be thrown to them as a distraction and means of calming them. Only unsalted peanuts shall be used and in modest amounts.

iv. If the adult remains on the nest while the nestling is being extracted, the nestling shall be shielded as it is removed from the nest so that the parent does not peck the chick.

v. Each nestling may be banded with a standard U.S. Geological Survey aluminum band and a single plastic color-leg band.

vi. All fledglings that were banded as nestlings shall be re-captured and banded with their full color-band complement once they have attained nutritional independence from their parents.

22. Blood may be collected from the brachial vein of nestlings, adults, and juveniles using a heparanized microhematocrit capillary tube and used for genetic sex determination (where unknown) and for other genetic analyses. No more than 1% of the body weight of a bird may be collected at one time.

F. Up to sixty (60) Florida scrub-jays per year may be fitted with radio transmitters and translocated to the Mosaic wellfield.

1. Hip-pack harnesses fitted with halohil transmitters that weigh 1.6g., approximately 2% of the body mass of an adult Florida scrub-jay, may be applied during the transfer to the hacking cage.

2. Any radio-fitted Florida scrub-jays shall be monitored daily by permittee for 11 weeks.

3. If telemetered Florida scrub-jays do not establish a territory in the initial 12 week monitoring period, they may be refitted with a transmitter for additional observation.

G. No injury or mortality is expected to occur to species covered under this permit. In the event that any injury or mortality occurs, all activities must cease, and the injury or mortality reported immediately (not to exceed 1 business day) to the Service's species recovery lead (https://www.fws.gov/media/recovery-leads-southeast) and Southeast Region Recovery Permit Coordinator at the address and telephone number noted in Condition M., below. Based upon consultation between these offices, a decision will be made as to whether any of the authorized activities can continue. Decisions will also be made concerning the disposition of any dead or injured specimens. The permittee shall provide a written statement to the Service's species recovery lead and Southeast Region Recovery Permit Coordinator, which documents the cause of the injury/mortality, and identifies the remedial measures that will be employed by the permittee to eliminate future mortality/injury events. The final decision on remedial measures and disposition of specimens rests with the Service. All dead Florida scrub-jays found in the project area shall be thoroughly soaked in water and frozen for later analysis of the cause of death, unless otherwise directed by the Service.

H. Permittee must carry a copy of this permit at all times when conducting the authorized activities. Shipments of collected biological materials should also be accompanied by a copy of this permit. Note that this permit is limited to the above activities and identified species.

I. Issuance of this permit does not constitute permission to conduct these activities on national wildlife refuges or any other public or private lands; such permission must be obtained separately from the appropriate landowner or land manager before beginning these authorized activities. This permit, neither directly nor by implication, grants right of trespass.

J. This permit is non-transferable.

K. Upon locating a dead, injured, or sick federally listed species, under circumstances not addressed in this authorization, initial notification must be made immediately to the Service field office in the state in which the specimen is found (https://www.fws.gov/visit-us). Notification should also be made by the next workday to the Southeast Region Permit Coordinator identified in Condition M., below. Those offices will

confer with the Service's Office of Law Enforcement as appropriate and determine next steps. Care should be taken in handling sick, injured, or dead specimens to ensure effective treatment or to preserve biological materials for later analysis. In conjunction with the care of sick or injured endangered or threatened species, and the preservation of biological materials from a dead individual, the finder should take responsible steps to ensure that the site is not unnecessarily disturbed.

L. An annual report summarizing the activities authorized under this permit must be submitted by January 31 following each year that this permit is in effect to the office identified in Condition M., as well as to the Service Field Offices in the State(s) where activities occurred (https://www.fws.gov/visit-us), and to the appropriate species recovery leads (https://www.fws.gov/media/recovery-leads-southeast). When possible, electronic copies shall be submitted in lieu of hard copies in MS Word, Portable Document Format, Rich Text Format, or other file format that is compatible with the receiving office. Each report should include, at a minimum, either a completed database reporting form supplied by the recovery coordinator for each species, or the following information:

1. Locations of capture, banding, radio-tagging, and translocations. Locations shall be noted using figures, maps, and by referencing a common coordinate system (e.g., latitude longitude, universal transverse mercator system, etc.).

2. The number, sex, and condition of banded and translocated *Aphelocoma coerulescens*.

3. The results of the banding, and population studies, with discussions and interpretations of the data in context to recovery of the species.

4. Copies of all published papers and reports that result from activities covered by this permit shall be submitted.

IF NO ACTIVITIES OCCURRED OVER THE COURSE OF THE YEAR, INDICATION OF SUCH SHALL BE SUBMITTED AS AN ANNUAL REPORT WITH A BRIEF EXPLANATION AS TO WHY NO ACTIVITY OCCURRED. NOTE: "NO ACTIVITY" MEANS THAT THERE WERE NO ATTEMPTS MADE TO CONDUCT THE ACTIVITIES AUTHORIZED IN THIS PERMIT (FOR EXAMPLE, NO ATTEMPTS TO CAPTURE).

M. For purposes of monitoring compliance and administration of the terms and conditions of this permit, the contact office of the U.S. Fish and Wildlife Service is:

U.S. Fish and Wildlife Service
Regional Recovery Permits Coordinator
1875 Century Boulevard
Atlanta, Georgia 30345-3301
Telephone: 404/679-7097
Facsimile: 404/679-7081
Permitsr4es@fws.gov

END

DEPREDATION

Permit Number: MB37878B

Version Number: 4

Effective: 2024-04-01 **Expires:** 2025-03-31

Issuing Office:

Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

MB Atlanta Permit Office
1875 Century Boulevard, NE
Atlanta, Georgia 30345
permitsR4MB@fws.gov
Tel: 404-679-7070

Resee Collins

Chief, Migratory Bird Permit Office, Atlanta, Georgia

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Resee Collins
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Permittee:

MOSAIC FERTILIZERS LLC

13830 CIRCA CROSSING DRIVE

LITHIA, FL 33547

Name and Title of Principal Officer:

Russell Schweiss Vice President, Land & Resource Strategies

Authority: Statutes and Regulations: 16 U.S.C 703-712 50 CFR Part 13, 50 CFR 21.100

Location where authorized activity may be conducted:

Mosaic Fertilizer LLC, Four Corners Mine 11200 SR 37 South, Bradley, Florida 33835

Central Screening Station, 17490 County Road 39, Lithia, Florida 33547 - Hillsborough and Manatee Counties

Agrock Train Maintenance; 1050 Old Highway 37, Bowling Green FL 33834, Polk County Lat: 27.6851 Long: -81.9575

South Fort Meade Mine Facility 5880 Manley Road. Fort Meade, FL 33841, Polk County Lat: 27.6678, Long: -81.7592

South Pierce Chemical Facility 7450 Co Rd 630, Fort Meade, FL 33841, Polk County Lat: 27.7657, Long: -81.9402

Reporting requirements:

DEPREDATION

Permit Number: MB37878B

Version Number: 4

Effective: 2024-04-01 **Expires:** 2025-03-31

ANNUAL REPORT DUE: 1/31 You must submit an annual report to your Regional Migratory Bird Permit Office each year, even if you had no activity. Form can be found at: **https://fwsepermits.servicenowservices.com/fws** Under "Explore Permits" select your permit type. Annual Report Form is under Permit Details.

Authorizations and Conditions:

A. You are authorized to take:

Species	Number Authorized	Method of Take
Black Vulture	25	See Condition B.
Turkey Vulture	25	See Condition B.

Birds taken must be used as effigies to deter vultures from roosting in the area. Permittee may have a federally permitted taxidermist preserve the carcasses as mounts or study skins for use as effigies. Lethal take is not to be the primary means of control. Active hazing, harassment or other non-lethal techniques must continue in conjunction with any lethal take of migratory birds.

B. You may use the following method(s) of take: Shotgun, in accordance with Standard Condition #6. Use of paint ball guns is prohibited.

C. Anyone who takes birds under the authority of this permit must follow the American Veterinary Medical Association Guidelines on Euthanasia (https://www.avma.org/resources-tools/avma-policies/avma-guidelines-euthanasia-animals (https://www.avma.org/resources-tools/avma-policies/avma-guidelines-euthanasia-animals)).

D. The following subpermittees are authorized: Any other person who is (1) employed by or under contract to you for the activities specified in this permit, or (2) otherwise designated a subpermittee by you in writing, may exercise the authority of this permit.

E. You and any subpermittees must comply with the below Standard Conditions. These standard conditions are nationwide and may not be modified for individual permits.

1. All of the provisions and conditions of the governing regulations at 50 CFR part 13 and 50 CFR part 21.100 are conditions of your permit. Failure to comply with the conditions of your permit could be cause for suspension of the permit. If you have questions regarding these conditions, refer to the regulations or, if necessary, contact your migratory bird permit issuing office. For copies of the regulations and forms, or to obtain contact information for your issuing office, visit: https://www.fws.gov/program/migratory-bird-permit/permit-types-and-forms (https://www.fws.gov/program/migratory-bird-permit/permit-types-and-forms)

2. General conditions set out in Subpart B of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance

with all applicable conditions, including the filing of all required information and reports.

3. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local tribal, or other federal law.

4. Valid for use by permittee named above.

5. To minimize the lethal take of migratory birds, you are required to continually apply non-lethal methods of harassment in conjunction with lethal control. Note: Explosive Pest Control Devices (EPCDs) are regulated by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). If you plan to use EPCDs, you require a Federal explosives permit, unless you are exempt under 27 CFR 555.141. Information and contacts may be found at https://www.atf.gov/resource-center/fact-sheet/fact-sheet-federal-firearms-and-explosives-licenses-types (https://www.atf.gov/resource-center/fact-sheet/fact-sheet-federal-firearms-and-explosives-licenses-types)

6. Shotguns used to take migratory birds can be no larger than 10-gauge and must be fired from the shoulder. You must use nontoxic shot listed in 50 CFR 20.21(j).

7. You may not use blinds, pits, or other means of concealment, decoys, duck calls, or other devices to lure or entice migratory birds into gun range.

8. You are not authorized to take, capture, harass, or disturb bald eagles or golden eagles, or species listed as threatened or endangered under the Endangered Species Act found in 50 CFR 17, without additional authorization. For a list of threatened and endangered species in your state, visit the U.S. Fish and Wildlife Service's Threatened and Endangered Species System (TESS) at: https://www.fws.gov/library/collections/endangered-species. (https://www.fws.gov/library/collections/endangered-species.)

9. If you encounter a migratory bird with a Federal band issued by the U.S. Geological Survey Bird Banding Laboratory, Laurel, MD, report the band number to http://www.reportband.gov (http://www.reportband.gov).

10. This permit does not authorize take or release of any migratory birds, nests, or eggs on Federal lands without additional prior written authorization from the applicable Federal agency, or on State lands or other public or private property without prior written permission or permits from the landowner or custodian.

11. Unless otherwise specified on the face of the permit, migratory birds, nests, or eggs taken under this permit must be:

(a) turned over to the U.S. Department of Agriculture for official purposes, or

(b) donated to a public educational or scientific institution as defined by 50 CFR 10, or

(c) completely destroyed by burial or incineration, or

(d) with prior approval from the permit issuing office, donated to persons authorized by permit or regulation to possess them.

12. A subpermittee is an individual to whom you have provided written authorization to conduct some or all of the permitted activities in your absence. Subpermittees must be at least 18 years of age. As the permittee, you are legally responsible for ensuring that your subpermittees are adequately trained and adhere to the terms of your permit. You are responsible for

maintaining current records of who you have designated as a subpermittee, including copies of designation letters you have provided.

13. You and any subpermittees must carry a legible copy of this permit, including these Standard Conditions, and display it upon request whenever you are exercising its authority.

14. You must maintain records as required in 50 CFR 13.46 and 50 CFR 21.100. All records relating to the permitted activities must be kept at the location indicated in writing by you to the migratory bird permit issuing office.

15. Acceptance of this permit authorizes the U.S. Fish and Wildlife Service to inspect any wildlife held, and to audit or copy any permits, books, or records required to be kept by the permit and governing regulations.

16. You may not conduct the activities authorized by this permit if doing so would violate the laws of the applicable State, county, municipal or tribal government or any other applicable law.

For suspected illegal activity, immediately contact USFWS Law Enforcement 1-844-FWS-TIPS (397-8477)

https://www.fws.gov/program/office-of-law-enforcement/contact-us (https://www.fws.gov/program/office-of-law-enforcement/contact-us)

5-Year Southeastern American Kestrel Permit for
Programmatic Listed Species Incidental Take Permit #PLSIT-24-0001,
for Mosaic Fertilizer, LLC

Issuing Office: Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Office of Conservation Planning Services
620 South Meridian Street, MS 2A
Tallahassee, FL

Permit Owner Name: Mosaic Fertilizer, LLC
Permit Owner Address: 13830 Circa Crossing Drive
Lithia, Florida 33547 UNITED STATES

Permit Number: PLSIT-24-0001-5YR-01
Effective Date: August 1, 2024
Expiration Date: August 1, 2029

Pursuant to the Programmatic Listed Species Incidental Take Permit PLSIT-24-0001 issued to Mosaic Fertilizer, LLC on July 3, 2024, Mosaic Fertilizer, LLC, by and through its designated agents, representatives and/or employees ("Mosaic"),

IS AUTHORIZED TO: incidentally take the southeastern American kestrel (*Falco sparverius paulus,* State Threatened), whereas "take" for the purposes of this permit shall consist of incidental take of up to 5 pairs of kestrels as a result of:

a. 620 acres of Significant Habitat Modification and/ or
b. Removal of 5 Inactive Nest Cavities

And incidental take of up to 3 pairs of kestrels as a result of:

c. Unanticipated Take on Mosaic Land outside the 15 Year Mine Plan via 310 acres of Significant Habitat Modification and removal of up to 3 Inactive Nest Cavities, pursuant to Part IX of the Programmatic Permit

due to mining, site reclamation, and other operational activities in Florida pursuant to Article IV, Section 9, Florida Constitution; Chapter 68A-27, Florida Administrative Code, and in accordance with the *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines* (available at www.MyFWC.com). This 5-Year Permit is subject to the provisions and definitions as provided in the Programmatic Permit (PLSIT-24-0001) and/or the December 2020 *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines*.

AUTHORIZED LOCATION(S):

Mosaic owns or controls approximately 374,312 acres in Florida as depicted in Exhibit A ("Mosaic Land"). Within the next fifteen years, Mosaic proposes to conduct Mining-Related Activities on approximately 13,620 acres within the Mosaic Land on lands located in Desoto, Hardee, Hillsborough, and Manatee Counties, although the actual areas on which mining is conducted and the rate of mining is dependent on receipt of appropriate authorizations from relevant governmental authorities, market conditions, technical feasibility, economic feasibility and related factors. The proposed area is shown on the 15-Year Mine Plan map in Exhibit B.

Within the next five years, Mosaic proposes to conduct Mining-Related Activities on approximately 6,944 acres within Mosaic Land located in Hardee, Hillsborough, and Manatee Counties. These areas are shown as the 5-Year Mine Plan on the 15-Year Mine Plan map in Exhibit B. However, given the foregoing constraints, other

areas within the 15-Year Mine Plan area may be disturbed by Mining-Related Activities in addition to or in lieu of the 5-Year Mine Plan area; the incidental take authorized on page 1 of this 5-Year Permit may occur anywhere within the 15-Year Mine Plan area provided it is within the 5-year time horizon of this permit.

This 5-Year Permit governs activities expected to occur within the 5-Year time horizon of the 15-Year Mine Plan site and any Unanticipated Take.

Permittee Signature Raoul Boughton Date 8/2/2024

Not valid unless signed. By signature, confirms that all information provided to issue this 5-Year Permit under Programmatic Permit PLSIT-24-0001 is accurate and complete and indicates acceptance and understanding of the provisions and conditions listed below. **Any false statements or misrepresentations when applying for this permit may result in revocation of this permit and/or felony charges.**

Authorized by: Josh Cucinella
Land Use Planning Program Administrator

Authorized for: Jennifer Goff
HSC Deputy Director

Authorizing Signature Josh Cucinella Date 8/1/2024

PERMIT CONDITIONS AND PROVISIONS

This 5-Year Permit is issued under the Programmatic Listed Species Incidental Take Permit (PLSIT-24-0001) (Programmatic Permit) for southeastern American kestrels in accordance with Rule 68A-27 of the Florida Administrative Code, the Imperiled Species Management Plan, and the *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines* (*Guidelines*). The terms used herein shall have the meaning given to them in the Programmatic Permit and/or the *Guidelines*.

1. This 5-Year Permit authorizes the specific activities, processes, and mitigation provided by Mosaic's application which may or will take the southeastern American kestrel (*Falco sparverius paulus*) incidental to the mining and reclamation activities authorized by state and local government permits and other required governmental authorizations. This permit contemplates that 'incidental take' may occur as harassment and molestation by significant habitat modification or degradation which could kill or injure, the above designated species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering associated with activities on the 15-Year Mine Plan site. The 5-Year Permit does not contemplate "intentional take" of the referenced birds, their eggs (when applicable), or nests associated with activities on the 15-Year Mine Plan site. The Programmatic Permit, as well as all information submitted in support of the Programmatic Permit, as described therein, includes the specific information for this 5-Year Permit, and is hereby incorporated by reference in this Permit as part of the Application. Mosaic shall immediately notify the Florida Fish and Wildlife Conservation Commission (FWC) at ConservationPlanningServices@MyFWC.com in writing of any previously submitted information that is later discovered to be inaccurate. The activities authorized by this Permit are all activities on the 15-Year Mine Plan site which will or may cause an incidental take of the southeastern American kestrel.
2. Based on information from the applicant and the best available information, the estimated impacts from the overall mining activity and operations over a 5-Year period by the Permittee would result in the incidental take of up to 5 kestrel pairs harmed as a result of Significant Habitat Modification of 620 acres of occupied Suitable Foraging Habitat and removal of 5 Inactive Nest Cavities within 0.31-miles of any Habitat Use Centroids established by Kestrel Surveys conducted as required by Part VI of the Programmatic Permit.

The Significant Habitat Modification is based on the acreage as described and delineated in the Application and 15-Year Mine Plan map (Exhibit B).

3. Any injury and/or mortality of kestrels or other listed species must be reported to FWC at ConservationPlanningServices@MyFWC.com and WildlifePermits@MyFWC.com. Injured wildlife should be taken to a FWC licensed wildlife rehabilitation facility.
4. Annual Surveys: The Permittee shall conduct annual Kestrel Surveys identified within Part VI of the Programmatic Permit.
5. Minimization: The Permittee shall implement the Minimization Measures identified within Part VII of the Programmatic Permit.
6. Mosaic shall implement the Mitigation for impacts to kestrels as identified in the Programmatic Permit (PLSIT-24-0001), which is incorporated by reference and a specific condition of this permit, to offset the incidental take authorized on page 1 of this 5-Year Permit.
    A. Mitigation: The Permittee shall implement the Mitigation in Part V.G. of the Programmatic Permit. As established by the Programmatic Permit, 60 poles/nest boxes will be installed within two years from the effective date of the Programmatic Permit and maintained for 10 years, 7,440 acres of Suitable Foraging Habitat will be provided around the poles on reclaimed Mosaic mining lands and managed in accordance with the Nest Box Placement provisions of the Guidelines for 10 years, and the Scientific Study will be conducted for five years. Approximately 1/6th of the total Mitigation in Part V.G. of the Programmatic Permit is expected to be applied toward the incidental take authorized on page 1 of this 5-Year Permit, as documented in the tracking Ledger required by Part IV.D of the Programmatic Permit.
    B. Financial Option: Pursuant to Part V.G.3 of the Programmatic Permit, if Mosaic does not or cannot perform Mitigation as set forth in Parts V.G.1 and V.G.2, or, as an option to mitigate for Unanticipated Take where Mosaic elects not to use the mitigation specified in Part V.G.1 or V.G.2 to offset the Unanticipated Take, Mosaic may exercise an option to provide a financial contribution to a conservation fund for kestrels. To exercise this option:
        i. If provided in lieu of Mitigation set forth in Parts V.G.1 and V.G.2, Mosaic must request an amendment to this 5-Year Permit, specifically identifying the details on take, how the mitigation was calculated, and for which pair/habitat.
        ii. If provided for Unanticipated Take, Mosaic must provide prior notice at least one week before carrying out the activity. The notice shall include a location map, an updated Ledger, and an analysis demonstrating that the approved Mitigation continues to provide a conservation benefit considering the additional take.
        iii. Mosaic shall make an upfront payment calculated by totaling $20,000 per pair for take associated with Significant Habitat Modification, which may include removal of an Inactive Nest Cavity. Payment shall be made by check, according to the directions provided in the Imperiled Species Permitting Conservation Fund Donation/ Contribution Form (Exhibit C).
        iv. Mosaic shall provide documentation to FWC (ConservationPlanningServices@MyFWC.com) that the contribution has been completed.
7. On an annual basis, the Permittee shall provide a copy of their tracking Ledger to FWC by October 30 containing the information set forth in Part IV.D of the Programmatic Permit.
8. Annual reports and Final Reports must be submitted to FWC pursuant to Part VIII of the Programmatic Permit.
9. The fully-executed Programmatic Permit and applicable fully-executed 5-Year Permit (or complete copy(ies) of each) must be prominently posted on any project site where Significant Habitat Modification and/or removal of Inactive Nest Cavities occur for inspection by all authorized officials (including but not restricted to FWC, U.S. Fish and Wildlife Service (USFWS), local building and zoning, law enforcement) prior to Significant Habitat Modification and/or removal of Inactive Nest Cavities and shall always remain posted until construction activities are complete. Mosaic is required to make the permit available upon

request by the above entities, including after construction activities are complete, for the duration of the permit.

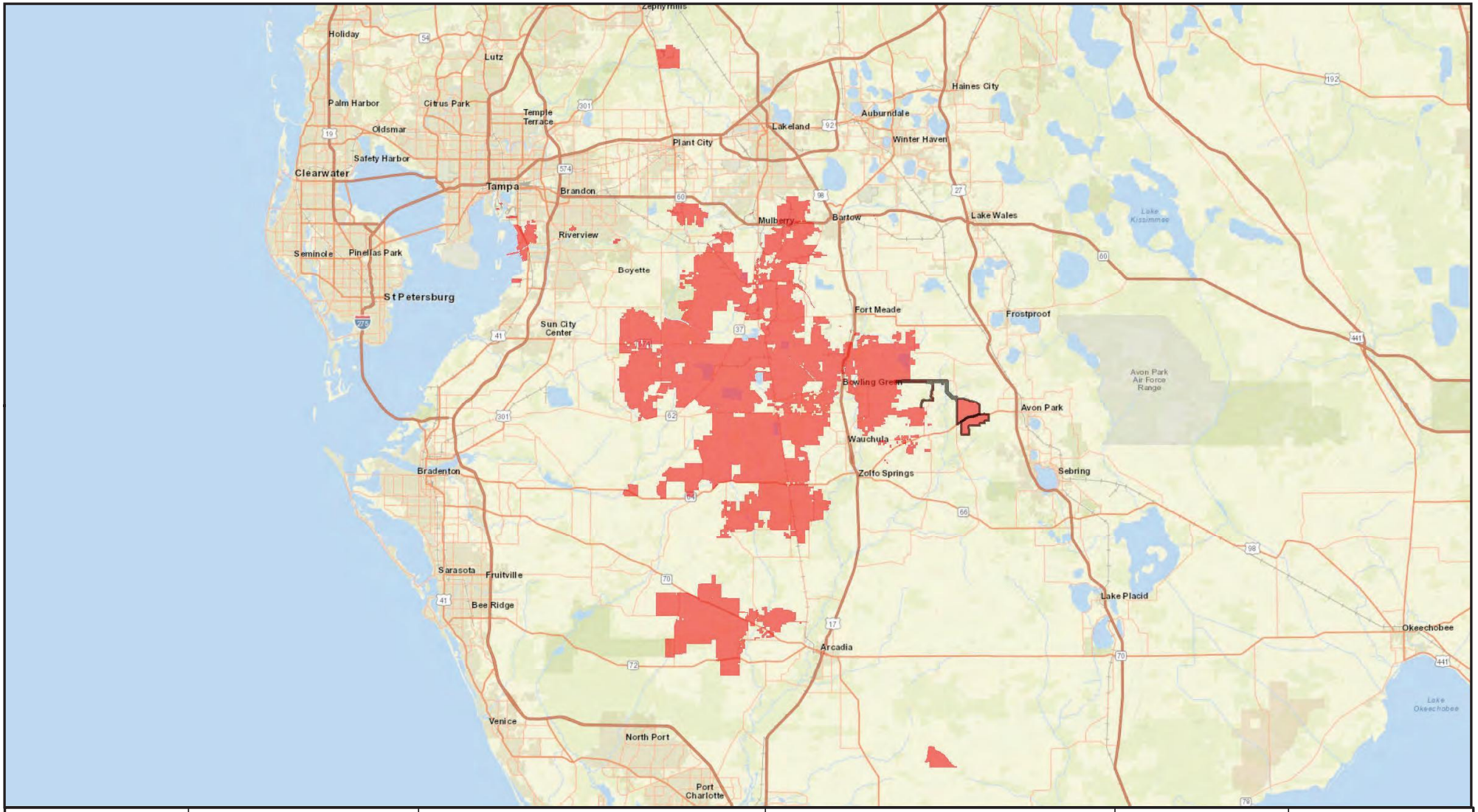
10. Except for the southeastern American kestrel as discussed above, this permit does not authorize incidental take of wildlife their nests and any parts thereof that are state-listed Threatened species (see Titles 68A-27, Florida Administrative Code (FAC) for complete listing of excluded species) or bald eagles (*Haliaeetus leucocephalus*) 68A-16.002 FAC. Permits for incidental take of additional listed species must be secured separately prior to conducting any proposed activity that would result in incidental take. In such cases, the Permittee must contact FWC's Protected Species Permit Coordinator at 850-921-5990 or by e-mail at WildlifePermits@MyFWC.com. Notice shall be provided to FWC's Conservation Planning Services at ConservationPlanningServices@MyFWC.com.
11. Failure of the Permittee to comply with the conditions of the Programmatic Permit and this 5-Year Permit, and applicable laws, rules, and ordinances may result in suspension or revocation of this permit, enforcement action in an appropriate court, in addition to any and all other enforcement actions available to the FWC or other governmental entities in regard to the Programmatic Permit and this 5-Year Permit.
12. This 5-Year Permit does not convey to the Permittee or create in the Permittee any property right, or any interest in real or personal property; nor does it authorize access or activities on any public property (including but not limited to sovereign submerged lands) or private property. Any required permission accordingly must be secured by the Permittee from the appropriate landholders prior to any such access or activities.
13. This 5-Year Permit does not relieve the Permittee from liability and penalties when the permitted activity causes harm or injury to: human health or welfare; animal, plant, or aquatic life; or property not specifically permitted herein. It does not allow the Permittee to cause pollution in contravention of Florida Statutes or applicable laws, rules, or ordinances.
14. This 5-Year Permit issued under the Programmatic Permit (PLSIT-24-0001) constitutes FWC authorization for the framework of Mining-Related Activities conducted by Mosaic. It does not authorize activities for which other governmental authorization is required; specifically (but without limiting the generality hereof) this Permit does not constitute any authorization required by the federal Endangered Species Act for the take or incidental take of species listed under the federal Endangered Species Act, activities which may require a permit from the U.S. Army Corps of Engineers or USFWS, nor activities for which water management district or local government authorization may be required. The permittee is solely responsible for obtaining all other governmental authorizations to undertake activities authorized by this permit.
15. The activities authorized under this 5-Year Permit may be carried out by Mosaic and/or its employees, representatives, agents or contractors under Mosaic's control. Accordingly, all such activities are the responsibility of Mosaic. Contact the FWC at ConservationPlanningServices@myfwc.com for additional information.
16. Mosaic, by signature above, confirms that representatives of the FWC have his/her permission to enter on and inspect the property(ies) described in the application (herein incorporated by reference) and any documents associated with this permit for all reasonable purposes pertaining to applicable FWC rules.
17. Federal authorization or permit(s) must be obtained from the USFWS before embarking upon activities involving or impacting active nests of Migratory Bird Treaty Act (MBTA) species, all nests of Endangered Species Act (ESA) species and other federally protected species.
18. This 5-Year Permit can be suspended, revoked, or not renewed for just cause, pursuant to 68-1.010, FAC, and Chapter 120, Florida Statutes.

A person whose substantial interests are affected by FWC's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. A person seeking a hearing on FWC's action shall file a petition for hearing with the agency within 21 days of receipt of written notice of the decision. The petition must contain the information and otherwise comply with section 120.569, Florida Statutes, and the uniform rules of the Florida Division of Administration, chapter 28-106, Florida Administrative Code. If the FWC receives a petition, FWC will notify the Permittee. The attached Explanation of Rights statement provides additional information as to the rights of parties whose substantial interests are or may be affected by this action.

Enclosure:

1) Explanation of Rights

Exhibit A
Mosaic Land Map



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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC.

DESOTO, HARDEE, MANATEE COUNTIES, FLORIDA

SFM-EE

Mosaic Holdings - 374,311.9 ac.



MOSAIC LAND MAP

FLATWOODS Consulting Group

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Exhibit B
15-Year Mine Plan Map with 5-Year Plan



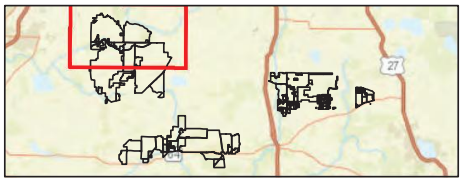
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK MANATEE, HARDEE COUNTIES, FLORIDA

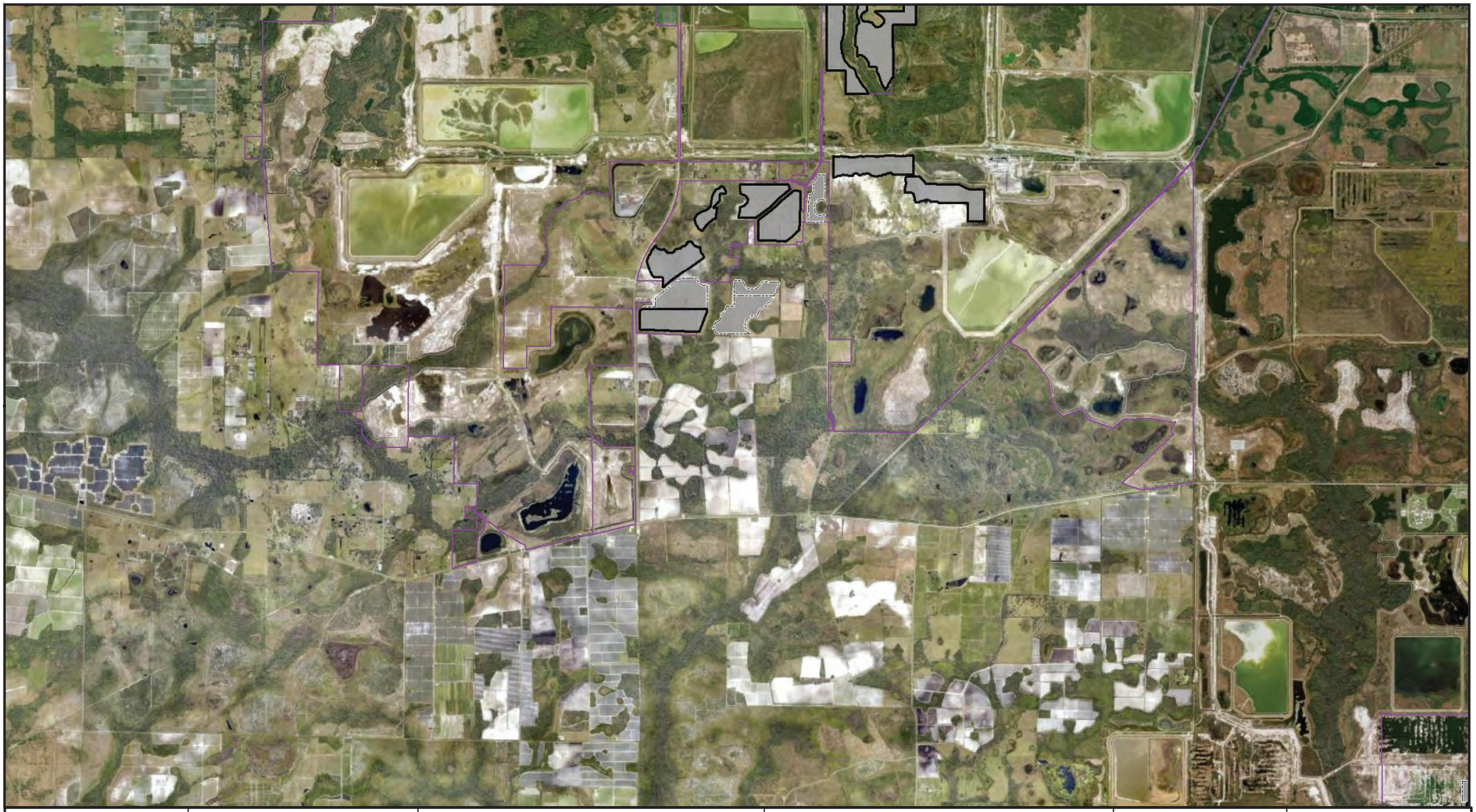
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR PROJECT SITE MAP 1 of 5

FLATWOODS Consulting Group

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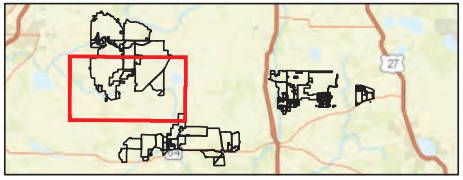
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK MANATEE, HARDEE COUNTIES, FLORIDA

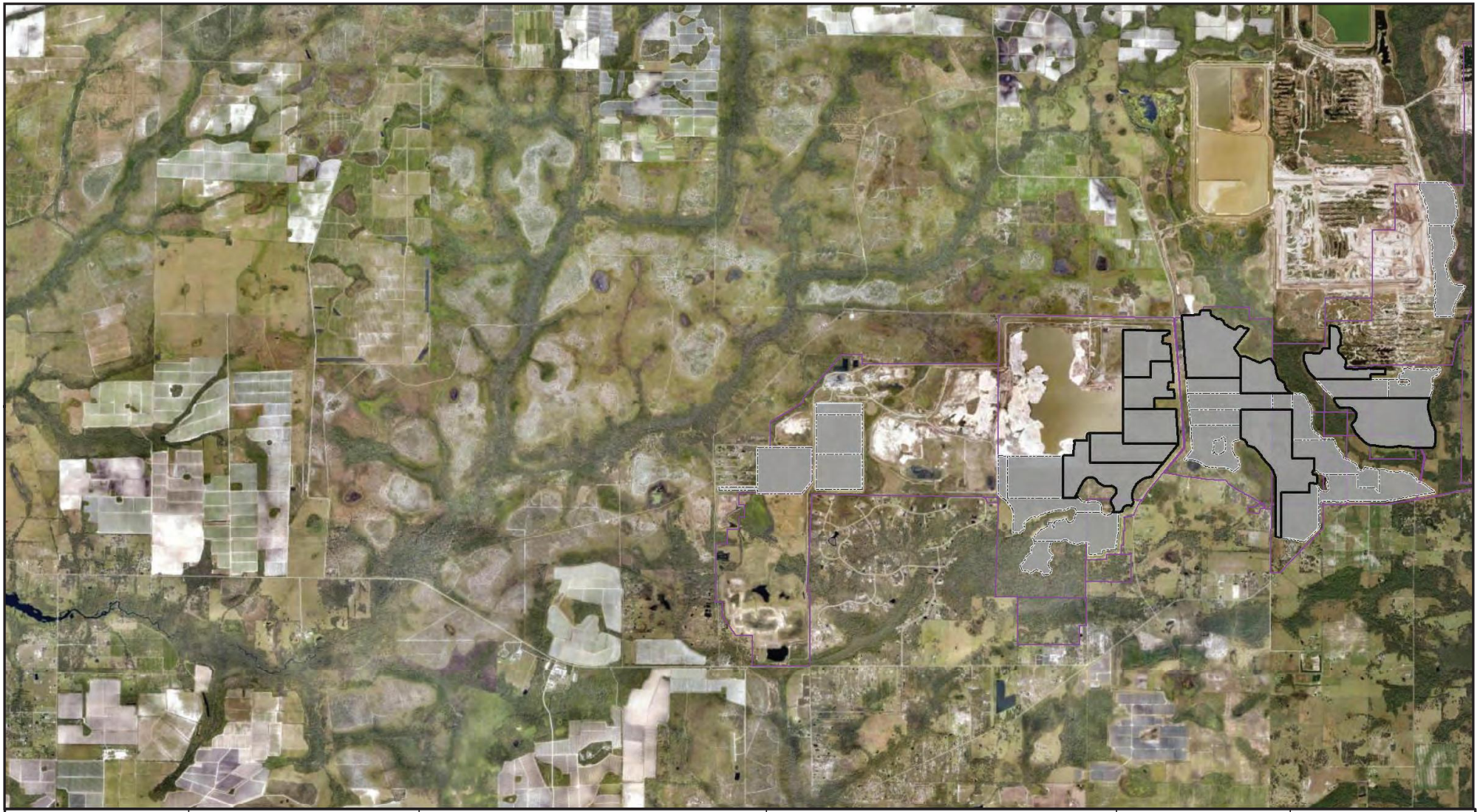
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR PROJECT SITE MAP 2 of 5

FLATWOODS Consulting Group

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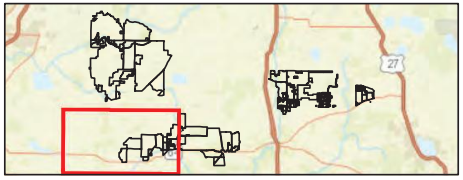
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MINE-WIDE FLORIDA
SOUTHEASTERN AMERICAN
KESTREL PROGRAMMATIC PERMIT
MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK
MANATEE, HARDEE
COUNTIES, FLORIDA

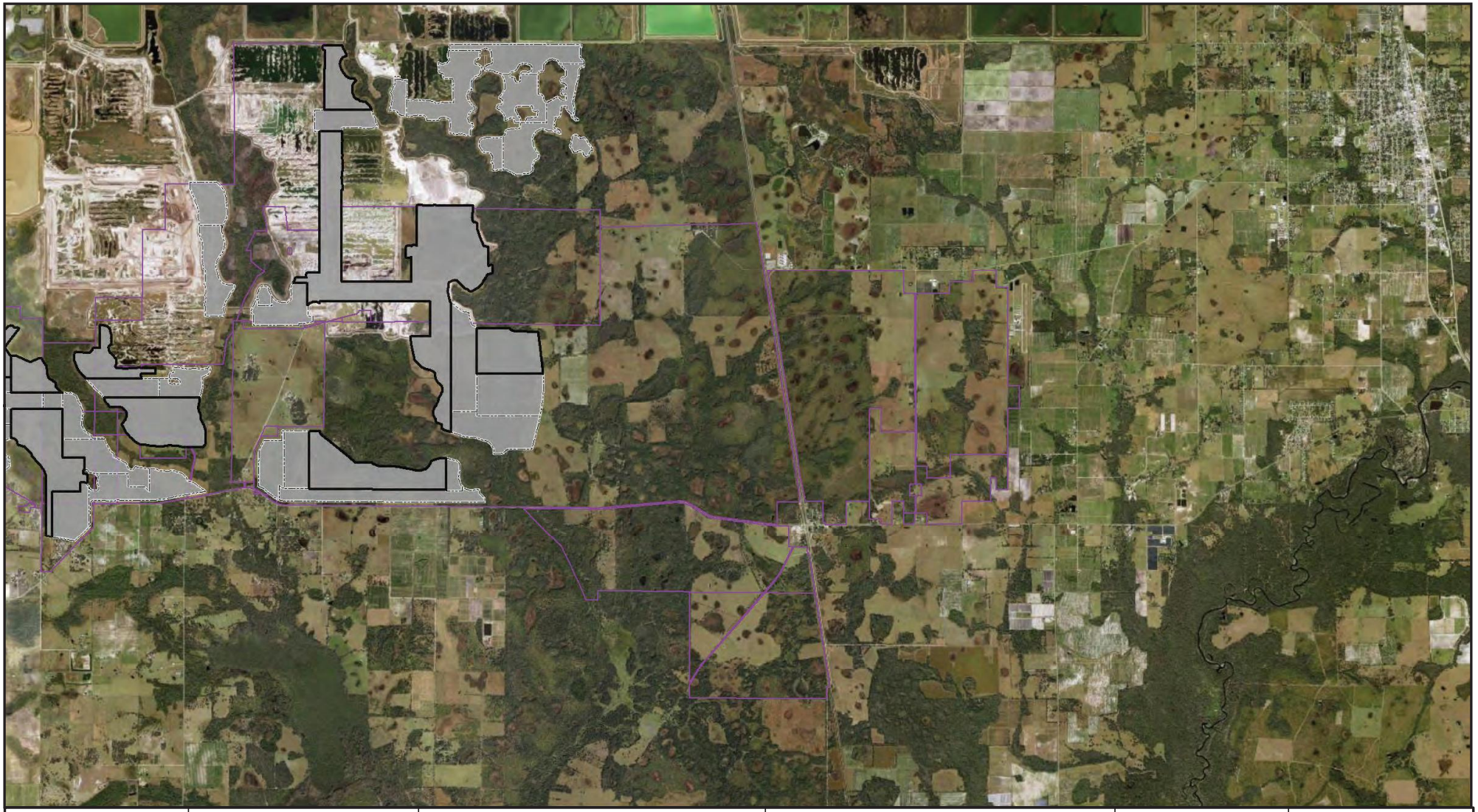
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR
PROJECT
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3 of 5

FLATWOODS
Consulting Group

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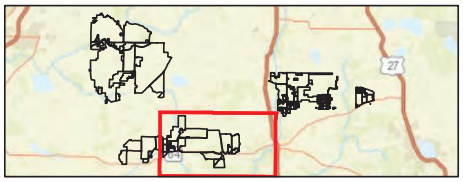
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK MANATEE, HARDEE COUNTIES, FLORIDA

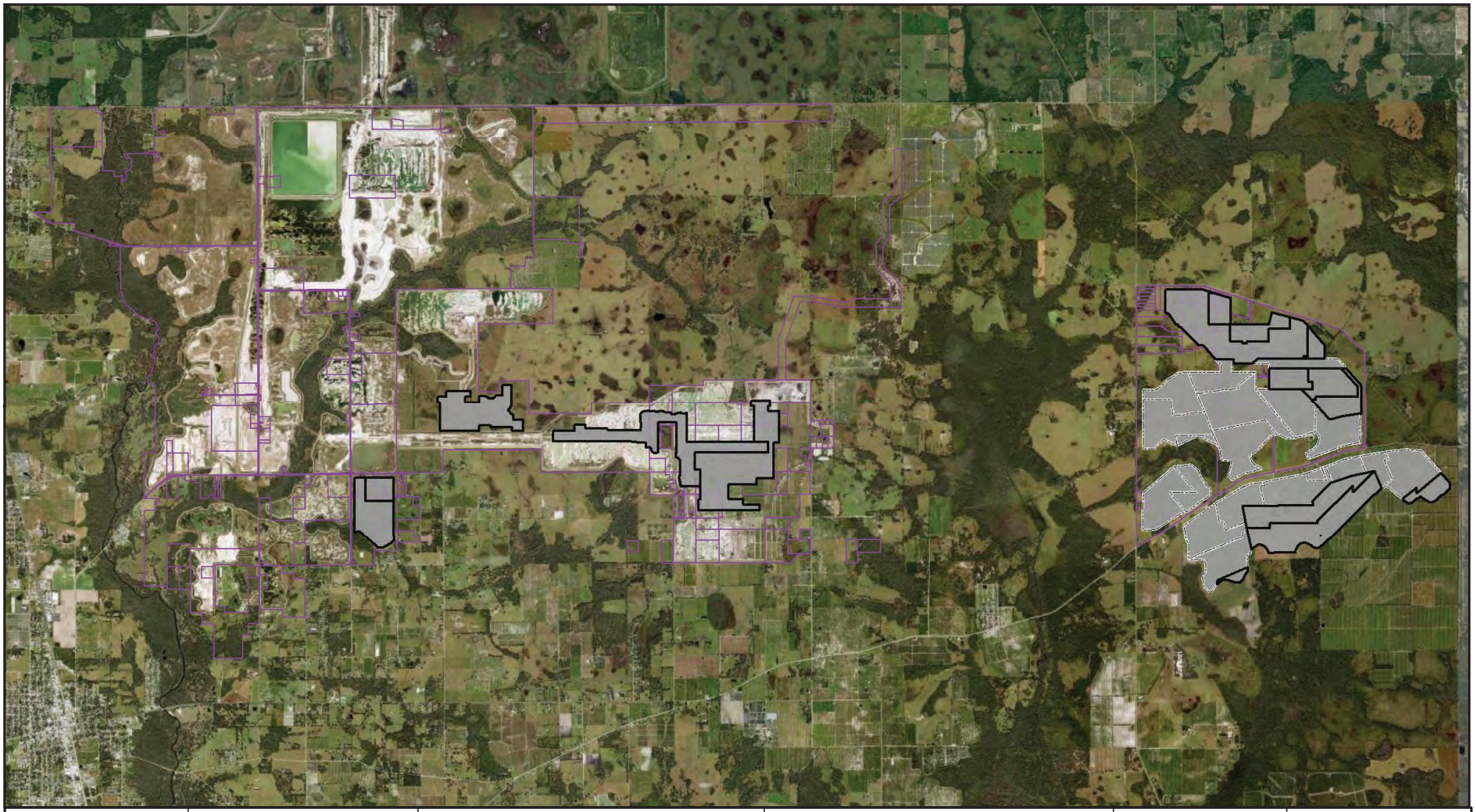
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR PROJECT SITE MAP 4 of 5

FLATWOODS Consulting Group

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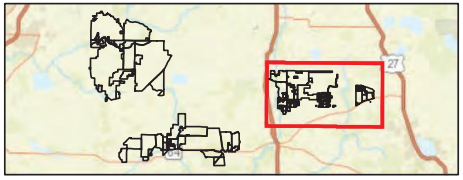
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MINE-WIDE FLORIDA
SOUTHEASTERN AMERICAN
KESTREL PROGRAMMATIC PERMIT
MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK
MANATEE, HARDEE
COUNTIES, FLORIDA

- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR
PROJECT
SITE MAP
5 of 5

FLATWOODS
Consulting Group

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Exhibit C
Imperiled Species Permitting Conservation Fund Donation/ Contribution Form



IMPERILED SPECIES PERMITTING CONSERVATION FUND
DONATION/CONTRIBUTION FORM

This source document must accompany all donations and contributions to the **Imperiled Species Permitting Conservation Fund**. **Mail completed form along with the donation/contribution to**:

Fish and Wildlife Foundation of Florida
Attn: Imperiled Species Permitting Conservation Fund
P.O. Box 11010
Tallahassee, FL 32302

Date: _____

Name: _____

Address: _____

Phone Number: ( ) _____ Email: _____

County: _____

Total Donation/Contribution: $ _____ *(Payable to **Fish and Wildlife Foundation of Florida**)*

Check/Warrant No.: _____

Please note the Foundation can not accept electronic credit card payments for permit related wildlife contributions at this time.

Complete this section only if deposit is being made pursuant to a permit.

FWC Permit Number: PLSIT-_____

********** **DO NOT WRITE BELOW THIS LINE** **********

Receipt Date: _____

Copy: Office of Conservation Planning Services, 620 South Meridian Street, MS 2A, Tallahassee, FL 32399

ConservationPlanningServices@MyFWC.com.

Programmatic Listed Species Incidental Take Permit

Programmatic Southeastern American Kestrel Permit, Application #99073, for Mosaic Fertilizer, LLC

Issuing Office: Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Office of Conservation Planning Services
620 South Meridian Street, MS 2A
Tallahassee, FL

Permit Owner Name: Mosaic Fertilizer, LLC
Permit Owner Address: 13830 Circa Crossing Drive
Lithia, Florida 33547 UNITED STATES

Permit Number: PLSIT-24-0001
Effective Date: July 3, 2024
Expiration Date: July 3, 2054

PROGRAMMATIC PERMIT: The purpose of this programmatic permit is to establish a long-term, overarching framework for communication and coordination between Mosaic Fertilizer, LLC, (Mosaic) and the Florida Fish and Wildlife Conservation Commission (FWC) to facilitate the conservation of southeastern American kestrels, set forth a long-term structure for kestrels on land owned or controlled by Mosaic, establish an efficient permitting process for Mosaic and FWC, and meet the legal requirements of rule and statute.

Permittee Signature _____ Date 7/8/2024

Not valid unless signed. By signature, confirms that all information provided to issue Programmatic Permit PSLIT-24-0001 is accurate and complete and indicates acceptance and understanding of the provisions and conditions listed below. **Any false statements or misrepresentations when applying for this permit may result in revocation of this permit and/or felony charges.**

Authorized by:
Josh Cucinella
Land Use Planning Program Administrator
Office of Conservation Planning Services

Authorized for:
Jennifer Goff, Deputy Director
Division of Habitat and Species Conservation

Authorizing Signature Josh Cucinella Date July 3, 2024

I. GENERAL

A. The southeastern American kestrel (*Falco sparverius paulus*) is designated as a Florida-threatened species.

B. The *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines* (*Guidelines*) provide a comprehensive overview of information related to recommended

conservation practices, survey requirements, avoidance measures, permitting, and mitigation for kestrels.

C. The southeastern American kestrel breeding season is March 1 through July 31 (kestrel breeding season).

D. The *Guidelines* recommend that surveys for the southeastern American kestrel be conducted between April and August due to the similar appearance of the migratory American kestrel and the southeastern American kestrel.

E. The *Guidelines* provide that a programmatic permit is possible on a case-by-case basis.

F. Conservation Planning Services is an Office within FWC's Division of Habitat and Species Conservation.

G. The Imperiled Species Management Plan encourages landowners with real estate holdings of significant regional impact and with the potential for extensive impacts to State-threatened species (kestrels) to coordinate with FWC for opportunities to provide regionally significant benefits, connectivity, and protection for species and their habitat.

H. Mosaic owns or controls approximately 374,312 acres in Florida as depicted in Exhibit A (Mosaic Land).

I. Within the first fifteen years of this Programmatic Permit, Mosaic anticipates conducting Mining-Related Activities on approximately 13,620.4 acres of Mosaic Land located in Hardee, Hillsborough, Manatee and Polk Counties (15-Year Project Site) (Exhibit B).

J. Rates and acreages of lands mined within any given period depend on receipt of appropriate authorizations from relevant governmental authorities, market conditions, technical feasibility, economic feasibility and related factors. Mosaic will continue to acquire ownership interests or rights in additional lands in the future, for incorporation into its overall mine development strategy and into this Programmatic Permit, as described in Part V.F.

K. Section 378.202, Florida Statutes (FS), declares that mining is a temporary land use because the statute requires that all lands affected by mining or mining activities must be reclaimed to a beneficial use in a timely manner.

L. FWC's Office of Conservation Planning Services recognizes that lands mined for phosphate must be reclaimed and lands reclaimed in accordance with Chapter 378 Part II, FS create landscape-level opportunities to provide regionally significant benefits, connectivity, and protections for multiple state-listed species and their habitats.

M. It is recognized that lands reclaimed as required by Chapter 378 Part II include substantial acres of potential Suitable Foraging Habitat and the statute states that conversion to incompatible land uses by mining is temporary rather than permanent.

N. The available lands owned or controlled by Mosaic provide an opportunity to allow for a comprehensive and beneficial approach to kestrel management and conservation due to Mosaic's extensive land holdings and operations.

II. AUTHORITY

Article IV, Section 9 of the Constitution of the State of Florida, Section 379.2291, FS, and Chapter 68A-27, Florida Administrative Code (FAC), and the *Imperiled Species Management Plan* provide the FWC with the authority to manage and conserve Florida wildlife. The FWC has adopted the *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines* as defined.

III. DEFINITIONS

Unless defined below or otherwise defined in this Programmatic Permit, the terms used in this document shall have the meaning given to them under the relevant rules, regulations, and supporting guidance documents publicized by the FWC in effect on the effective date of this permit.

A. **5-Year Permit**: A permit issued by the FWC under this Programmatic Permit that authorizes Mosaic to remove a specific number of unoccupied kestrel nest cavities and allows Significant Habitat Modification for a specific acreage for a 5-year period.

B. **15-Year Mine Plan**: An estimated long-range mine development strategy, created by Mosaic and submitted to FWC with each application for the 5-Year Permit renewal cycle. The 15-Year Mine Plan delineates the geographic area from which Mosaic can remove a specified number of unoccupied kestrel nest cavities and significantly modify a specific acreage of kestrel habitat pursuant to its 5-Year Permit, with the exception of Unanticipated Take. The purpose of the 15-Year Mine Plan is to assist Mosaic in the identification of future mining/expansion areas, which will enable Mosaic to estimate kestrel impacts associated with Mining-Related Activities.

C. **Cooperative Land Cover**: The FWC Cooperative Land Cover (CLC), Version 3.4, November 2019 (as subsequently revised). CLC crosswalks to FLUCCS.

D. **Florida Land Use Cover and Forms Classification System**: The Florida Land Use Cover and Forms Classification System (FLUCCS), 1999 (as subsequently revised) which is a handbook issued by the Florida Department of Transportation that includes codes for various native and non-native habitats in Florida. FLUCCS crosswalks to CLC.

E. **Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines**: *Guidelines* established by the FWC setting forth survey protocols, recommended conservation practices, avoidance and minimization measures, potential mitigation options, incidental take permits, and intentional take permits. Unless otherwise indicated, any reference to the *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines* shall mean that version adopted in December 2020, and subsequent amendments, attached as Exhibit C.

F. **Kestrel Survey**: A kestrel survey conducted in accordance with the recommended survey section of the *Guidelines*. Mosaic shall incorporate the Habitat Use Centroid method to determine Significant Habitat Modification associated with Mining-Related Activities for the 5-Year Permit and for the 15-Year Mine Plan.

G. **Suitable Cavity**: Hollow spaces within a tree or man-made structure that can support kestrel breeding and sheltering during or outside of the breeding season. Usually unobstructed by vegetation with an entrance hole about 3 inches in diameter and 10 feet or more off the ground.

H. **Active Nest Cavity**: A Suitable Cavity supporting breeding, which occurs from the point of cavity selection by a breeding pair to incubation and rearing of dependent chicks. Prior to eggs being laid during the breeding season, cavity selection can be determined if one or both kestrels are observed entering, exiting, or sitting inside the cavity.

I. **Inactive Nest Cavity**: An Active Nest Cavity once the breeding season is over and the young have fledged. Inactive Nest Cavities will be used by kestrels for multiple breeding seasons and will be used outside of the breeding season for sheltering.

J. **Suitable Foraging Habitat**: Consists of the following CLC landcover classes, including high pine and scrub (scrub 1210, upland coniferous 1230, sandhill 1240), mowed grass (1810), low intensity urban (urban open pine 182112, grass 18213), rural (rural open pine 18312,

agriculture – cropland/pasture 18331). Within these landcover types, Suitable Foraging Habitat is either (1) open, low herbaceous vegetation less than 10 inches tall or (2) low scrub oaks with interspersed sandy patches. In pine dominated forest or sandhill communities, the canopy cover is less than 40 %.

K. **Habitat Use Centroid**: The center point of documented kestrel foraging use from the average point of observed kestrel locations from surveys as outlined in the *Guidelines*. This is used to estimate the location of a kestrel territory and associated Suitable Foraging Habitat.

L. **Significant Habitat Modification**: Reduction of Suitable Foraging Habitat to less than 124 acres (50 ha) within a 0.31-mi (0.50-km) radius around the Habitat Use Centroid, unless the Suitable Foraging Habitat within the radius was already less than 124 acres.

M. **Mosaic Land**: Land in Southwest Florida, largely located in DeSoto, Hardee, Hillsborough, Manatee, and Polk Counties, in which Mosaic currently has an ownership interest or other rights or acquires an ownership interest or other rights in the future. Mosaic Land that is reasonably expected to be subject to Mining-Related Activities within the next 15 years is incorporated into Mosaic's 15-Year Mine Plan, which is updated every 5 years. Mosaic Land as of the effective date of this Programmatic Permit is depicted on Exhibit A. Additional lands may be incorporated into the Programmatic Permit through modification of the Permit as set forth in Part V.F.

N. **Mining-Related Activities**: Clearing, grading, road construction, mining, reclamation, and other physical activities associated with the operational use of the Mosaic Land by Mosaic. Normal and customary agricultural or silvicultural practices do not constitute Mining-Related Activities. The term does not include prospecting.

O. **Mitigation Area**: Mosaic Land on which Mosaic will provide the mitigation referenced in Part V.G of this permit.

P. **Reclaimed Land**: Land modified by mining operations and then reshaped in a manner which meets the reclamation standards for land disturbed by phosphate mining activities, including revegetation, contained in Chapter 62C-16, FAC.

Q. **Revegetation**: In reclaimed areas, a cover of vegetation consistent with the standards established pursuant to Chapter 62C-16.0021(18) and consistent with the land form created and the future land uses.

R. **Unanticipated Take**: An event where Mosaic needs to remove an Inactive Nest Cavity or carry out an unplanned activity that would result in Significant Habitat Modification to a kestrel territory (Habitat Use Centroid) outside the 15-Year Mine Plan in order to protect human health, welfare, and safety, and/or the structural integrity of an area or for operational necessity as reasonably determined by Mosaic. Unanticipated Take must comply with Part IX.

S. **Emergency Take**: An event where Mosaic must remove an active nest on Mosaic Land that cannot be avoided without risk to property or people.

T. **Total Authorized Take**: The maximum allowable incidental take of kestrels issued for the duration of the Programmatic Permit with specific take to be authorized by each 5-Year Permit.

U. **Actual Incidental Take**: The number of pairs of kestrels, amount of Significant Habitat Modification, and the number of Inactive Nest Cavities removed. Actual Incidental Take is only authorized by the 5-Year Permit and shall not cumulatively exceed the Total Authorized Take identified in Part IV.B.

IV. PROGRAMMATIC PERMITTING

A. **Programmatic Approach**: This Programmatic Permit authorizes a framework of activities, processes, and mitigation which may or will result in take of the southeastern American kestrel (*Falco sparverius paulus*) incidental to Mining-Related Activities. This Programmatic Permit contemplates that 'incidental take' may occur as harassment and/or harm resulting from Significant Habitat Modification that is reasonably expected to kill or injure the above designated species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering, as a result of Mosaic Mining-Related Activities. The Programmatic Permit does not contemplate "intentional take" of the referenced birds, their eggs (when applicable), or nests associated with activities on this Project. The application for this Permit, originally dated March 13, 2023, and all other information submitted by the applicant contained in the FWC application file (Application), including the response to request for additional information submitted June 1, 2023, and additional information provided on April 19, 2024, and June 27, 2024, is hereby incorporated by reference in this Programmatic Permit as part of the Application. Mosaic shall immediately notify the FWC in writing of any previously submitted information that is later discovered to be inaccurate. Specific activities on Mosaic Land which will or may cause an incidental take of the southeastern American kestrel will be authorized on a 5-year basis.

B. **Total Authorized Take:** Based on information from the applicant and the best available information, the estimated impacts from the overall mining activity and operations on Mosaic Land over a 30-year period by Mosaic would result in the incidental take of southeastern American kestrel up to 30 kestrel pairs harmed or harassed as a result of the removal of 30 Inactive Nest Cavities and/or Significant Habitat Modification of 3,720 acres of Suitable Foraging Habitat, within 0.31-miles of any Habitat Use Centroids established by Kestrel Surveys conducted as required herein. Specific take amounts within the Total Authorized Take will be authorized by 5-Year Permits.

C. **Mitigation**: Mitigation for the Total Authorized Take will consist of nest box/nest pole installation in areas of at least 124 acres of surrounding Suitable Foraging Habitat, associated nest box and vegetation maintenance, and an associated Scientific Study as set forth in Part V.G. below and in Appendix 1 (Mitigation Proposal).

D. **Ledger**: Mosaic and FWC shall each maintain a running ledger under this Programmatic Permit reflecting the number of nest boxes/nest poles installed and associated Suitable Foraging Habitat established within 0.31-acres around each pole as upfront mitigation [Appendix 2]. Mosaic will submit an updated ledger by October 30 of each year indicating on an individual and cumulative basis the Actual Incidental Take in the preceding 12-month period. Actual Incidental Take will include the pairs of kestrels, acres of Significant Habitat Modification and the number of Inactive Nest Cavities removed or destroyed. The ledger shall include any applicable financial contributions provided as mitigation. The ledger shall also reflect the Projected Incidental Take for the next 12-month period, based on whether the annual surveys documented the actual presence of nest cavities and occupied nesting territories anticipated to be impacted by Mining-Related Activities in the next 12 months, including the pairs of kestrels, acres of Significant Habitat Modification and the number of Inactive Nest Cavities reasonably anticipated to be removed or destroyed. The ledger will reflect if no Actual Incidental Take occurred in the preceding year. Where Actual Incidental Take actually occurred in the preceding year, the ledger will reflect, by year, an adjusted mitigation amount reflecting a 2:1 reduction of the Total Mitigation by the Actual Incidental Take in the

preceding year to reflect the Total Mitigation Remaining.[1] To demonstrate the temporary nature of Mining-Related Activities and associated kestrel take, and to show the kestrel habitat impacts are temporary in nature, Mosaic shall also include in the ledger the acres of Suitable Foraging Habitat reclaimed in the preceding year.

V. PERMITTING

A. DURATION: The duration of this Programmatic Permit shall be 30 years from the date of issuance.

B. INTENT: During the course of this Programmatic Permit, Mosaic intends to apply for and FWC intends to issue individual permits in five (5) year increments to Mosaic authorizing incidental take of southeastern American kestrels consisting of Significant Habitat Modification and removal of Inactive Nest Cavities. No more than one individual permit shall be in effect at one time. These individual 5-Year Permits shall follow the *Guidelines*, with modifications as provided in this Programmatic Permit. Where the two are in conflict, the terms of this Programmatic Permit shall control.

C. SPECIFIC PERMIT DURATION: Each 5-Year Permit issued under this Programmatic Permit shall be for a duration of 5 years from the date of issuance, or for 5 years from the expiration date of the previously issued 5-Year Permit, whichever is longer. Each 5-Year Permit shall authorize the removal of a specific number of Inactive Nest Cavities and a specific acreage of Significant Habitat Modification as determined by the Kestrel Surveys of the Mosaic Land within the proposed mining area and provided with the application.

D. PERMIT PROCESS:

1. As part of each 5-Year Permit application, Mosaic shall submit a 15-year Mine Plan that reflects Mosaic's best estimate of the mining and operation sequence for the upcoming 15-year period. It is recognized that rates and acreages of lands mined within any given period depend on receipt of appropriate authorizations from relevant governmental authorities, market conditions, technical feasibility, economic feasibility and related factors. The information from the first 5 years in the 15-Year Mine Plan will be used in the estimate of take of kestrels for the 5-Year Permit, along with kestrel survey data. The remaining information will be used to estimate a contingency factor to be applied to ensure the amount of mitigation proposed remains adequate to achieve a Net Conservation Benefit.
2. The 15-Year Mine Plan shall include maps showing existing FLUCCS codes, with Suitable Foraging Habitat specifically identified and a crosswalk table showing CLC codes, recent aerial imagery, approved post-reclamation FLUCCS, with Suitable Foraging Habitat specifically identified and a crosswalk table showing CLC codes, and Kestrel Survey data.
3. In the 5-Year Permit application, Mosaic shall include a report that identifies the kestrel pairs expected to be harmed based on the estimated number of Inactive Nest Cavities and acreage of Significant Habitat Modification expected to occur within the 5-Year

[1] As an example, the initial ledger will reflect Total Authorized Take of 30 kestrel pairs, via Significant Habitat Modification of up to 3,720 acres of Suitable Foraging Habitat within 0.31-mile of up to 30 Inactive Nest Cavities. If in 2027, Mosaic removes two nest cavities and their associated territories (496 acres), the Total Authorized Take would be adjusted to 28, and the Total Mitigation Remaining would be reduced to 54 nest boxes/trees and 6,944 acres of Suitable Foraging Habitat remaining available to compensate for future incidental take over the life of the Programmatic Permit.

time horizon of the 15-Year Mine Plan and shall be based on the Kestrel Surveys conducted following the *Guidelines*.

4. Mosaic will conduct an annual Kestrel Survey in the Mosaic Land expected to be impacted by Mining-Related Activities until March 1 of the following year to identify territories and nesting cavities and locations of minimization measures to be undertaken (e.g., buffer nesting cavities, planned disturbance of the site outside of the breeding season). Survey data will be summarized in the annual reports required by Part VI.B and in the application for the 5-Year Permit. The cumulative annual survey data will be used to estimate the expected incidental take in the application for the 5-Year Permit.
5. Mosaic shall estimate the anticipated amount of take of kestrels associated with each 5-Year Permit application. The requested amount of take shall be based on the prior survey report(s) and shall include the number of nesting cavities, kestrel pairs, and acreage of Suitable Foraging Habitat. Mosaic shall also identify, quantify, and summarize the Mitigation approved in this Permit and identify the quantity of the approved Mitigation that is expected to be applied toward the amount of take requested in the application, at a ratio of 2:1. An updated 15-Year Mine Plan and ledger will be included in each application.
6. The application shall include maps that depict the areas of Suitable Foraging Habitat impacted by Mining-Related Activities in the preceding 5 years and the Suitable Foraging Habitat that has been reclaimed in the preceding 5-Year period.
7. The application shall include Mosaic's most recent annual ledger, prepared in accordance with Part IV.D., above, for estimated take and the amount of the up-front mitigation that will be used to offset the requested take for the 5-Year Permit application.
8. Mosaic may elect to provide an additional conservation donation as a supplement or shall provide mitigation if needed to offset Unanticipated Take of kestrels as provided in Part IX. This information will be included in the updated ledger and updated as part of the running balance.
9. Within 30 days after completing the removal of any inactive nest cavities, Mosaic shall provide notice of the action to FWC at ConservationPlanningServices@MyFWC.com.
10. Mosaic shall submit an annual ledger as required by Part IV.D and an annual activities report as required by Part VIII.J.

E. PERMIT MODIFICATIONS: Mosaic shall strive to plan for and submit permit applications such that each 5-Year Permit fully addresses the extent of take of southeastern American kestrels by the number of Inactive Nest Cavities and/or the acreage of Significant Habitat Modification during that permit term. However, in the event that unexpected circumstances arise, Mosaic and FWC staff shall work together to amend the 5-Year Permit as needed. Only one 5-Year Permit will be in effect at a time. If the Total Authorized Take is projected to exceed 30 kestrel pairs or Inactive Nest Cavities and 3,720 acres of Significant Habitat Modification as a result of any activities undertaken pursuant to this permit, a modification to the Programmatic Permit is required. Mosaic must apply for any permit modifications referenced in this document at least ninety (90) days prior to the date that the amendment or modification is needed, but shall use reasonable efforts to apply for the modification as soon as becoming aware of the need to modify the permit.

F. MOSAIC LAND:

1. FWC staff recognize that during the duration of this Programmatic Permit, Mosaic may sell or otherwise convey land subject to this Programmatic Permit due to unforeseen circumstances or market changes, which may include the acquisition of outparcels or the acquisition of new lands that are not reflected in Exhibit A. Any removal or addition of lands subject to this Programmatic Permit will require modification of the Programmatic Permit as described in this part. Removal of lands subject to this Programmatic Permit shall not require permit modification; however, if lands offered as mitigation pursuant to Part V.G will be removed, Mosaic shall provide notice to FWC as provided in Part V.G.4.
2. To add lands or parcels subject to the Programmatic Permit, Mosaic shall submit a request to FWC at ConservationPlanningServices@MyFWC.com. The requests shall be submitted on an annual or biannual basis. No more than one request shall be submitted every six months.
3. The request shall include specific location maps, a legal description of the parcel(s) to be added, and an updated Mosaic Lands map showing all lands added and removed since the last update of the map. FWC staff will grant any request to add lands to the Programmatic Permit if this information is provided, barring any unforeseen circumstances that make adding the acreage to the permit illegal or otherwise contrary to the purposes of this permit, and FWC shall update the Mosaic permit file with the updated map or maps and ledger.
4. If FWC staff determines that the information provided by Mosaic or their designated representative does not include the information specified above, FWC staff will request in writing (via e-mail) the additional information within 30 days of receipt.
5. If FWC staff requests additional information regarding any new parcel being incorporated into the Programmatic Permit, Mosaic will provide the requested information within 30 days of receipt of the request for additional information.
6. If FWC staff does not request additional information within these timeframes and/or does notify Mosaic in writing that the information is sufficient, then the parcel will be deemed to be included in the Programmatic Permit, barring any unforeseen circumstances that make permitting the additional acreage illegal or otherwise contrary to the purposes of this permit, and FWC shall update the Mosaic permit file with the updated map or maps and ledger.
7. Mosaic will include the added parcel(s) in the next application for a 5-Year Permit and/or in the 15-Year Mine Plan if the parcel(s) are proposed for disturbance within that time period. If the application indicates that Mining-Related Activities on the added parcel(s) will result in additional incidental take in excess of the Mitigation provided pursuant to Part V.G, Mosaic shall provide mitigation that is sufficient to achieve a net conservation benefit, and FWC and Mosaic will work together to amend this Programmatic Permit and the 5-Year Permit to reflect the increased Total Authorized Take and corresponding increased mitigation, as provided in Parts V.F and V.G.3.

G. MITIGATION: Mosaic has offered and FWC has accepted programmatic mitigation measures for the anticipated incidental take of up to 30 pairs of kestrels as a result of Significant Habitat Modification, consisting of temporarily removing up to 30 kestrel

territories (3,720 acres of Suitable Foraging Habitat) and 30 Inactive Nest Cavities, as described below.

1. Mosaic shall install 60 used utility poles with both nest boxes and cavities within the poles, each of which will be surrounded by at least 124 acres (7,440 acres total) of Suitable Foraging Habitat on existing reclaimed Mosaic lands, which is equivalent to a 2:1 ratio per impacted inactive nest cavity and associated kestrel territories. The Mosaic Land on which the poles are installed, and the Suitable Foraging Habitat on Mosaic Land within a 0.31-mile radius around each pole is known herein as the Mitigation Area. The approximate locations of 50 of the nest boxes/poles and the Suitable Foraging Habitat surrounding them are depicted on Maps 1-4 in Appendix 1 (Proposed Mitigation Map Set). The actual location of the nest boxes will be dependent on the factors set forth in Appendix 1 based on the available Suitable Foraging Habitat in the reclaimed landscape in which the nest boxes are installed. The locations of the additional 10 boxes will be added to the Proposed Mitigation Map Set and included with annual mitigation status reports.
    a. All 60 nest boxes/poles will be installed no later than two (2) years from the effective date of this Permit, at a rate of at least 30 nest boxes per year. Monitoring of each nest box in accordance with Part V.G.2 will commence immediately upon installation of each pole and shall not be delayed until all 60 nest boxes are installed. Each nest box/pole will be monitored for at least 5 years regardless of date of installation.
    b. Nest boxes shall be maintained for a minimum of 10 years after installation.
    c. Vegetation shall be maintained to remain low and open within 100 feet of the nest box for a minimum of 10 years after installation.
    d. Mitigation Area shall be managed for a minimum of 10 years in accordance with the *Guidelines* (see Nest Box Placement). Management may include such activities as burning, control of nuisance species, tree thinning, and supplemental planting of ground cover species.
    e. Nest boxes shall be annually cleaned and the nesting material shall be replaced annually for a minimum of 10 years after installation.
    f. Mosaic will submit annual reports to FWC as required by Part VIII.H consisting of all management activities within the Mitigation Area and shall include a map showing the as-built location of each nest box/pole upon installation. This report can be included in the scientific study annual reporting or within an annual activity report after the study is completed.
2. Scientific Study: Mosaic shall conduct research to assess population status, demographics, and reproductive health of kestrels in human-modified landscapes, specifically reclaimed mining lands. Specifically, Mosaic shall complete a five-year scientific study associated with the installed kestrel nest boxes in order to assess population status, demographics, and reproductive health of kestrels in human-modified landscapes, specifically reclaimed mining lands. Mosaic shall submit annual status reports to FWC for the duration of the study and a final report to FWC. The study shall be conducted in accordance with the following conditions and with Appendix 1 (Mitigation Proposal). In the event of a conflict between Appendix 1 and this Permit, this Permit controls.

a. Study shall be conducted for a minimum of five (5) years after installation of the nest box/poles.
b. Observations of occupancy in boxes on reclaimed land shall be recorded for five (5) years.
c. Annual monitoring shall occur over three monitoring events, specifically during the first weeks of April, May, and June to be conducted by Mosaic or their Registered Agent. Monitoring protocol will follow the *Guidelines*.
    i. Nest box condition shall be recorded.
    ii. Occupancy shall be determined through a 30-minute observation event from 50 meters.
    iii. General productivity will be documented, including adult kestrels bringing food to the nest and any fledglings observed.
    iv. Any use of a pole scope or any activities that interfere with the normal behavior of the kestrels is not authorized by this permit and will require a separate Scientific Collecting Permit.
d. Annual reports shall be provided to FWC staff by October 30.
e. A final report will be provided to FWC by October 30 of the 5th year of the completion of the study.

3. Funding Option: If for any reason Mosaic does not or cannot perform all or part of the Mitigation set forth in Parts V.G.1 and V.G.2 above, Mosaic may exercise an option to provide a financial contribution to a conservation fund for kestrels in lieu of all or part of the mitigation obligations in Parts V.G.1 or V.G.2 above, without the need to amend this permit, and the associated 5-Year Permit will be amended accordingly. Mosaic must exercise this option to mitigate for any Unanticipated Take where Mosaic elects not to use the mitigation specified in Part V.G.1 or V.G.2 to offset the Unanticipated Take. This option shall be clearly identified in the 5-Year Permit application and will consist of an upfront payment calculated by totaling $20,000 per pair for take associated with Significant Habitat Modification, which may include an Inactive Nest Cavity. If exercised, the specific contribution shall be provided to the FWC Imperiled Species Management Fund to support activities which provide a conservation benefit for southeastern American kestrels. Prior to undertaking any ground disturbing activities, Mosaic shall provide correspondence to FWC indicating that a contribution has been provided in the name of Mosaic. Alternatively, FWC staff and Mosaic can negotiate alternative mitigation that at no time shall be less than the mitigation options in Part V.G. as an amendment to the 5-Year Permit to replace all or part of the Mitigation outlined in Part V.G. or to provide supplemental mitigation if needed. Any alternative mitigation shall comply with the *Guidelines*.
4. Transfer of Mitigation Area: Mosaic shall retain the ability to access and inspect, maintain, repair and/or replace the nest boxes/poles and conduct the work within the Mitigation Area required by Parts V.G.1 and V.G.2 above, for the 10 years after nest box installation. Mosaic shall include the following statement in any instrument that sells, conveys, or transfers all or part of the Mitigation Area:

This land contains a nest box installed as mitigation to offset the incidental take of the southeastern American kestrel (*Falco sparverius paulus*), which is designated as a Florida-threatened species.

Activities within 490 feet (150 meters) of the nest box may constitute harassment or harm of kestrels, requiring authorization from FWC. Removal or modification of the nest box shall be coordinated with FWC. Significant alteration or destruction of kestrel foraging habitat, which is located within a 0.31-mile (0.5 km) radius of the nest box typically requires authorization from FWC, pursuant to the *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines*.

VI. ANNUAL SURVEYS

A. Mosaic shall conduct annual Kestrel Surveys as described in the recommended survey section of the *Species Conservation Measures and Permitting Guidelines for the Southeastern American Kestrel* from April-August in undeveloped habitat planned for development during the breeding season. The survey results will be used to determine the number of nest cavities and associated kestrel territories to be incidentally taken during the year and are valid until March 1st of the following breeding season. If surveys must take place outside of the recommended survey window (April to August), all kestrels observed shall be considered southeastern American kestrels.

B. Annual Kestrel Surveys shall focus on areas where Mining-Related Activities are proposed until March 1 of the following breeding season. Kestrel Surveys shall include all areas expected to be impacted by Mining-Related Activities before the next breeding season. The survey data will be summarized in the annual reports required by Part VIII.H and J and shall be included in the application for each Five-Year Permit.

C. Surveys shall document kestrel sightings and shall determine the Habitat Use Centroid as set forth in the *Guidelines*. The Habitat Use Centroid(s) shall be overlaid with the boundary of mining units anticipated to mined or disturbed prior to March 1 of the next breeding season to determine whether any reduction of Suitable Foraging Habitat within a 0.31-mile radius around the Habitat Use Centroid will constitute Significant Habitat Modification.

VII. MINIMIZATION

Mosaic shall implement the following minimization measures for species impacts, which shall become specific conditions of this Programmatic Permit and any subsequently issued 5-Year Permit.

1. If active nest cavities are found, a buffer of 490 feet (150 meters) shall be established around each nest cavity location. The buffer zone shall be clearly visible to all personnel associated with the project.
2. Mosaic shall avoid activities within the buffer during the breeding season (March 1 to July 31) to the greatest extent possible.
3. If work activity must be conducted within 490 feet of an active nest cavity:
    a. Mosaic shall minimize the noise and duration of the activity.
    b. Mosaic shall avoid any activity that blocks the entrance to the nest or creates an obstacle for kestrels flying in and out of the nest.

c. Mosaic shall conduct work activity within 490 feet during daylight hours to avoid bright lighting and disturbance within the buffer at night.
d. Failure to comply with a - c would lead to incidental take not anticipated by this permit and would require additional permitting and mitigation by Mosaic in accordance with the *Guidelines*.

4. Take of any inactive nest cavity shall occur outside the breeding season.
5. Mosaic will reclaim mined lands to provide suitable foraging habitat for kestrels.

VIII. CONSERVATION COMMITMENTS

A. To demonstrate the temporary nature of Mining-Related Activities and associated kestrel take, and to show the kestrel habitat impacts are temporary in nature, Mosaic shall provide an annual ledger documenting the acres of Suitable Foraging Habitat reclaimed on Mosaic Land in the preceding year. Additionally, in the application for each 5-Year Permit, Mosaic will document the mandatory reclamation of mined lands that provide land use cover types that could be used as Suitable Foraging Habitat for kestrels by providing a copy of the conceptual reclamation plan(s) approved by the Department of Environmental Protection for each mine covered by that 5-Year Permit.

B. Mosaic shall install 60 kestrel nest boxes on 7,440 acres of Suitable Foraging Habitat existing reclaimed Mosaic lands, which is equivalent to a 2:1 ratio per impacted inactive nest cavity.

C. Mosaic shall manage the reclaimed lands with kestrel nest boxes in a manner following the recommended conservation practices as outlined in the *Guidelines.*

D. Mosaic shall complete a five-year scientific study associated with the installed kestrel nest boxes in order to assess population status, demographics, and reproductive health of kestrels in human-modified landscapes, specifically reclaimed mining lands. Mosaic shall submit annual status reports to FWC and a final report to FWC.

E. Mosaic shall retain the ability to access and inspect, maintain, repair and/or replace the installed nest boxes/poles for 10 years following installation and conduct the scientific study provided as mitigation for this Programmatic Permit until the five-year scientific study has been completed and the final report has been submitted to FWC.

F. Mosaic shall notify FWC in writing at least 30 days prior to a change in ownership or control of Mosaic Land containing a nest box or nesting territory provided as mitigation for this Programmatic Permit.

G. Mosaic shall include the following statement in the instrument that sells, conveys, or transfers the land: "This land contains a nest box installed as mitigation to offset the incidental take of the southeastern American kestrel (*Falco sparverius paulus*), which is designated as a Florida-threatened species. Activities within 490 feet (150 meters) of the nest box may constitute harassment or harm of kestrels, requiring authorization from FWC. Removal or modification of the nest box shall be coordinated with FWC. Significant alteration or destruction of kestrel foraging habitat, which is located within a 0.31-mile (0.5 km) radius of the nest box, typically requires authorization from FWC, pursuant to the *Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines*."

H. ANNUAL MITIGATION REPORTS: Mosaic will provide a report of the Scientific Study/Mitigation Area to FWC staff annually by October 30 of each calendar year. The first annual report shall cover the one-year period from the time that the Programmatic Permit is issued. The annual report shall include the following information:

1. A list and mapped location of all activities conducted for the year, including number and location of nest boxes/poles installed.
2. Location and description of all management activities conducted in the Mitigation Area, including dates, persons involved, and photographs.
3. Monitoring activity and results for the Mitigation Area, including dates, persons involved, locations, and photographs.
4. Analysis of the results, comparing observed reproductive success on Mitigation Area to average kestrel reproductive success.

I. FINAL MITIGATION REPORT: Mosaic will provide a final report with all annual monitoring data, appropriate summaries, and analysis of the complete 5-Year Study. The report shall be provided by October 30 of year of completion of the study.

J. ANNUAL ACTIVITIES REPORT: Mosaic shall provide an annual report by October 30, which may at Mosaic's option be combined with the annual mitigation report required by Part VIII.H above, that includes an updated ledger containing the information specified in Part IV.D, above, a summary of the kestrel survey conducted in the preceding breeding season, the total number of Inactive Nest Cavities and associated nesting territories removed in the preceding year, and the Suitable Foraging Habitat reclaimed in the preceding year.

IX. UNANTICIPATED TAKE

If Mosaic determines that an unplanned mining operation or activity is necessary outside the 15-Year Mine Plan area and would result in the need to remove an Inactive Nest Cavity and/or would result in Significant Habitat Modification outside the 15-Year Mine Plan, Mosaic shall provide prior notice to FWC at least one week before carrying out the activity. The notice shall include a location map, an updated ledger prepared pursuant to Part IV.D, and an analysis demonstrating that the approved Mitigation continues to provide a net conservation benefit considering the additional kestrel take. Mosaic may exercise an option to voluntarily provide a financial contribution to a conservation fund for kestrels as identified in Part V.G.3, and, if so, shall update the ledger to reflect the additional take, offset by the financial contribution. Unanticipated Take shall be limited to no more than 310 acres of Significant Habitat Modification and up to 3 Inactive Nest Cavities, per 5-Year Permit. If this limit is reached or is anticipated to be reached, Mosaic shall notify FWC staff to review the Unanticipated Take and determine if there is a need to modify the Actual Incidental Take in a 5-Year Permit or, if necessary, the Total Authorized Take in the Programmatic Permit. Mosaic and FWC will work together to evaluate solutions for addressing the amount of mitigation in the 5-Year Permit renewal process or in the Programmatic Permit.

X. EMERGENCY TAKE

In the unlikely event an Emergency Take scenario arises, FWC will be notified immediately and not more than 24 hours of confirming an active nest that creates a human health and/or safety risk or threatens the structural integrity of an area, was located and that measures to avoid or minimize impacts to the nest are not possible. FWC will be consulted on appropriate methods ahead of taking an active nest. The nest contents (eggs or flightless young) will be removed by an appropriately qualified ecologist and transferred to an appropriate wildlife rehabilitation facility as directed by FWC. After removing the contents of the nest, the cavity (i.e. nest tree) will be removed. This take

authorization does not constitute authorization from the U.S. Fish and Wildlife Service under the Migratory Bird Treaty Act.

XI. MISCELLANEOUS

A. Mosaic must ensure that the species conservation benefit (e.g. minimization and mitigation measures) described in Part V.G are met as set forth in that part or provide acceptable new mitigation via request for a permit amendment, modification, and/or specific individual permit application to FWC at ConservationPlanningServices@MyFWC.com. If the net conservation benefit required by Part V.G is not achieved, Mosaic and FWC will collaborate to establish acceptable new conservation benefits through a programmatic permit benefit, modification, and specific individual permits.

B. Any injury, mortality and/or other take not covered by the terms of this permit of the above threatened avian species or other listed species must be reported to this office at WildlifePermits@MyFWC.com and by upload to the permit account in the Online Permit System. Injured wildlife should be taken to a FWC licensed wildlife rehabilitation facility (https://myfwc.com/media/5423/licensedwildliferehabilitatorsbyregion.pdf). Disposition of carcasses of those specimens is subject to individual approval by FWC.

C. The activities authorized under this Programmatic Permit and subsequent 5-Year Permits may be carried out by Mosaic and/or its employees, representatives, agents, or contractors. Accordingly, all such activities are the responsibility of Mosaic and Mosaic is liable for the actions of its employees, representatives, agents, and contractors. Contact the FWC at ConservationPlanningServices@MyFWC.com for additional information.

D. Federal authorization or permit(s) must be obtained from the USFWS before embarking upon activities involving or impacting active nests of Migratory Bird Treaty Act (MBTA) species, all nests of Endangered Species Act (ESA) species and other federally protected species.

E. This Programmatic Permit and any specific individual permit issued in conjunction with the programmatic permit does not authorize access to any public or private property.

F. The fully-executed Programmatic Permit and applicable fully-executed 5-Year Permit (or complete copy(ies) of each) must be prominently posted on any project site where Significant Habitat Modification and/or removal of Inactive Nest Cavities occur for inspection by all authorized officials (including but not restricted to FWC, USFWS, local building and zoning, law enforcement) prior to Significant Habitat Modification and/or removal of Inactive Nest Cavities or other activities authorized under this permit and shall always remain posted until construction activities are complete. Mosaic is required to make the permit available upon request by the above entities for the duration of the permit.

G. Mosaic shall notify FWC electronically at ConservationPlanningServices@MyFWC.com of a change in ownership or control of the Mitigation Area prior to the Permit expiration date.

H. Mosaic shall remain liable for any corrective actions that may be required as a result of any permit violations prior to issuance of a permit amendment or as a result of permit violations on the property after change in ownership but while former owner still holds the permit.

I. By signature above, Mosaic confirms that representatives of the FWC have his/her permission to enter on and inspect the property(ies) described in the application (herein incorporated by reference) and any documents associated with this permit for all reasonable purposes pertaining to applicable FWC rules.

J. Failure of Mosaic to comply with this Permit and conditions, and applicable laws, rules, and ordinances may result in suspension or revocation of this permit, enforcement action in an

appropriate court, in addition to any and all other enforcement actions available to the FWC or other governmental entities in regard to this Permit.

K. This Permit does not convey to Mosaic or create in Mosaic any property right, or any interest in real or personal property; nor does it authorize access or activities on any public property (including but not limited to sovereignty submerged lands) or private property. Any required permission accordingly must be secured by Mosaic from the appropriate landholders prior to any such access or activities.

L. This Permit does not relieve Mosaic from liability and penalties when the permitted activity causes harm or injury to: human health or welfare; animal, plant, or aquatic life; or property not specifically permitted herein. It does not allow Mosaic to cause pollution in contravention of FS or applicable laws, rules, or ordinances.

M. This Programmatic Permit constitutes FWC authorization for the framework of activities conducted by Mosaic, including mining, reclamation, and mitigation and specific 5-Year Permits issued under the Programmatic Permit. It does not authorize activities for which other governmental authorization is required; specifically (but without limiting the generality hereof) this Permit does not constitute any authorization required by the federal ESA for the take or incidental take of species listed under the federal ESA, activities which may require a permit from the U.S. Army Corps of Engineers or USFWS, nor activities for which water management district or local government authorization may be required. Mosaic is solely responsible for obtaining all other governmental authorizations to undertake activities authorized by this permit.

A person whose substantial interests are affected by FWC's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. A person seeking a hearing on FWC's action shall file a petition for hearing with the agency within 21 days of receipt of written notice of the decision. The petition must contain the information and otherwise comply with section 120.569, Florida Statutes, and the uniform rules of the Florida Division of Administration, chapter 28-106, Florida Administrative Code. If the FWC receives a petition, FWC will notify the Permittee. The attached Explanation of Rights statement provides additional information as to the rights of parties whose substantial interests are or may be affected by this action.

Enclosure: Explanation of Rights

Enclosure

Explanation of Rights

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
EXPLANATION OF RIGHTS

If your substantial interests are or will be determined by the Florida Fish and Wildlife Conservation Commission's action or proposed action stated in the accompanying notice, you may make any one of the following elections on the attached Election of Rights form and file the form within twenty-one (21) days from the date you receive the notice of agency action or proposed action. If you so choose, please return the completed Election of Rights form with the enclosed Petition for Administrative Proceeding form completed in accordance with Chapter 28-106, Florida Administrative code, or a substitute document in compliance with Chapter 28-106, of the Florida Administrative code, to the address listed on the Election of Rights form.

1. If you wish to contest the agency action or proposed action, but do not dispute any of the issues of material fact set forth in the notice, you may request an informal proceeding pursuant to Sections 120.569 and 120.57(2), Florida Statutes. In the event that your request for an informal proceeding is granted, you will be given the opportunity to either simply present a written statement challenging the grounds upon which the Commission has chosen to justify its action or inaction or present evidence in mitigation.

Any request for an informal proceeding in this matter should be made by checking the space marked as 1 on the Election of Rights form and filing the completed and signed form with the Commission within twenty-one (21) days from the date of receipt of the notice. In making such a request, you must include with the completed and signed Election of Rights form either the completed and signed Petition for Administrative Proceeding form completed in accordance with Chapter 28-106, Florida Administrative code, or a substitute document in compliance with Chapter 28-106, of the Florida Administrative code. Additionally, your request must include a copy of the notice of agency action or proposed action being challenged.

2. If you wish to contest agency action or proposed action and you dispute one or more of the issues of material fact as set forth in the notice, you may request a formal hearing pursuant to Sections 120.569 and 120.57(1), Florida Statutes. If there is a disputed issue of material fact and your request is otherwise complete, an administrative law judge shall be furnished by the Division of Administrative Hearings of the Department of Management Services pursuant to Sections 120.569 and 120.57(1), Florida Statutes. A petition shall be dismissed if it fails to state disputed issues of material fact, it otherwise is not in substantial compliance with the requirements of 28-106.201(2) or 28-106.2015(5) FAC, or it has been untimely filed.

Any request for a formal hearing in this matter should be made by checking the space marked as 2 on the Election of Rights form and filing the completed and signed form with the Commission within twenty-one (21) days from the date of receipt of the notice. In making such a request, you must include with the completed and signed Election of Rights form either the completed and signed Petition for Administrative Proceeding form completed in accordance with Chapter 28-106, Florida Administrative code, or a substitute document in compliance with Chapter 28-106, of the Florida Administrative code. Additionally, your request must include a copy of the notice of agency action or proposed action being challenged.

3. If you do not wish to contest the agency action or proposed action, you may indicate this by checking the space marked as 3 on the Election of Rights form and filing the completed and signed form with the Commission. If you make this election, you do not need to include the completed and signed Petition form.

Failure to make any election in this matter, as provided above, within twenty-one (21) days from the date you received the notice, shall be considered a waiver of your rights to any administrative proceeding as provided in either 1 or 2, above.

Mediation is not an available alternative with respect to this action or proposed action.

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

ELECTION OF RIGHTS

I have read the Explanation of Rights provided to me by the Florida Fish and Wildlife Conservation Commission (Commission) and understand my options. (You may select one of the options below and return this form to the Commission no later than 21 days from the receipt of the notice of agency action or proposed action or, if you do not want an administrative hearing or informal proceeding, you do not need to complete this form)

☐ 1. I am challenging the agency action and want an informal proceeding. I do not dispute any of the issues of material fact in the notice of agency action or proposed action, but do want an informal proceeding, pursuant to Sections 120.569 and 120.57(2), Florida Statutes. I understand that I may either submit a written statement or submit evidence in mitigation to the agency head or designated representative. I have attached the completed and signed Petition for Administrative Proceeding form completed in accordance with Chapter 28-106, Florida Administrative code, or a petition that complies with Chapter 28-106, of the Florida Administrative code.

☐ 2. I am challenging the agency action and want an administrative hearing. I do dispute one or more issues of material fact in the notice of agency action or proposed action, I have attached the completed and signed Petition for Administrative Proceeding form completed in accordance with Chapter 28-106, Florida Administrative code, or a petition that complies with Chapter 28-106, of the Florida Administrative code, and I request a formal hearing, pursuant to Sections 120.569 and 120.57(1), Florida Statutes, before an administrative law judge appointed by the Division of Administrative Hearings.

☐ 3. I do not wish to challenge the agency action. I do not dispute any of the issues of material fact in the Notice of action or proposed action and waive my right to object or to be heard.

I have read and understand the Election of Rights form and understand that I have the right to be represented by counsel or a qualified representative at an administrative proceeding. I also understand that I must attach a petition to this request if I have requested a hearing or an informal proceeding.

Please sign and state your current address and telephone number:

_____	_____
Signature	**Date**
_____	_____
PRINT NAME	**Phone Number**

The above indicated person is Δ the Petitioner, Δ counsel for the Petitioner, or Δ the qualified representative of the Petitioner (Please check one).

_____	_____
_____	_____
_____	_____
Petitioner's name and address	Attorney or representative's name and address (if applicable)
_____	_____
Petitioner's email address	Attorney or representative's email address

If applicable, please list the type of Permit /License applied for and the Permit/License Number

_____

Please email form to: efile@myfwc.com

Or mail form to: **Legal Office**
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

PETITION FOR ADMINISTRATIVE PROCEEDING
Compliance of Section 120.569(2)(c), Florida Statutes, and
Chapter 28-106, Florida Administrative Code

Only if challenging the agency action, please complete this form or otherwise provide the information required by Chapter 28-106, of the Florida Administrative Code and email it to the below address, or you may send to the following address along with the completed Election of Rights form and a copy of the challenged agency action:

Email: efile@myfwc.com
Or mail to: Legal Office
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600

1. Please list the name and address of each agency affected and each agency's file or identification number, if known:

2. Please identify the petitioner (the individual or organization requesting the hearing):
Name: _____
Address: _____
Phone number: (_____) ____— _____

3. Please identify the petitioner's counsel or representative (if any):
Name: _____
Address: _____
Phone number: (_____) ____— _____

[The address of petitioner's counsel or representative, if listed above, shall be the address for service purposes during the course of the proceedings]

4. Please explain how the petitioner's substantial interests are or will be affected by the Commission's action or proposed action:

5. Please explain when and how the petitioner received notice of the Commission's action or proposed action:

6. Please indicate whether the petitioner disputes any material facts and, if so, state all disputed material facts:

7. Please concisely state the ultimate facts alleged, including a statement of the specific facts that the petitioner contends warrant reversal or modification of the Commission's action or proposed action:

8. Please state the specific rules or statutes that the petitioner contends require reversal or modification of the Commission's action or proposed action:

9. Explanation of how the alleged facts (7) relate to the specific Rules or Statutes (8) stated above:

10. Please state the relief sought by the petitioner, stating precisely the action that the petitioner wants the Commission to take with respect to the action or proposed action:

Either the Petitioner, counsel for the Petitioner, or the qualified representative of the Petitioner must sign below agreeing that the person signing this document has read this Petition, made a reasonable inquiry, and is not filing this document for any improper purposes, frivolous purpose, or needless increase in the cost of litigation.

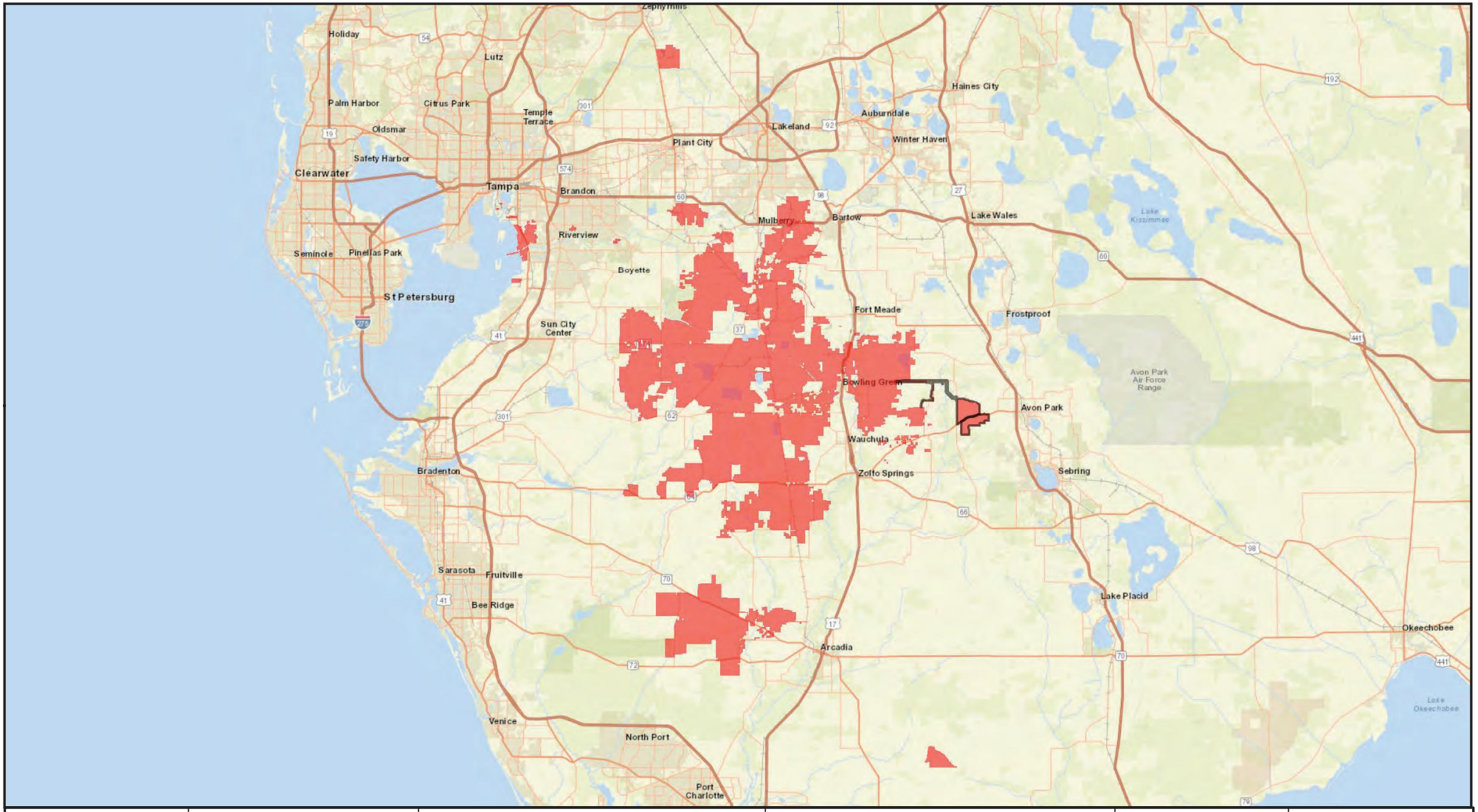
Signature **Date**

PRINT NAME

The above indicated person is ☐ the Petitioner, ☐ counsel for the Petitioner, or ☐ the qualified representative of the Petitioner (Please check one).

Exhibit A

Mosaic Lands Map



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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC.

DESOTO, HARDEE, MANATEE COUNTIES, FLORIDA

SFM-EE

Mosaic Holdings - 374,311.9 ac.



MOSAIC LAND MAP

FLATWOODS Consulting Group

P:\0003MOS\141-FEP\GIS\PROGRAMMATIC KESTREL LOCATION MOSAIC HOLDINGS 03082023.mxd

Exhibit B

15-Year Mine Plan Map with 5-Year Plan



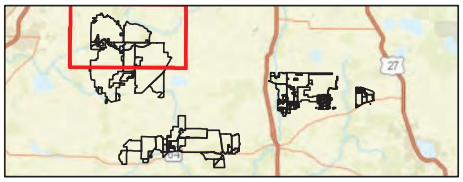
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK MANATEE, HARDEE COUNTIES, FLORIDA

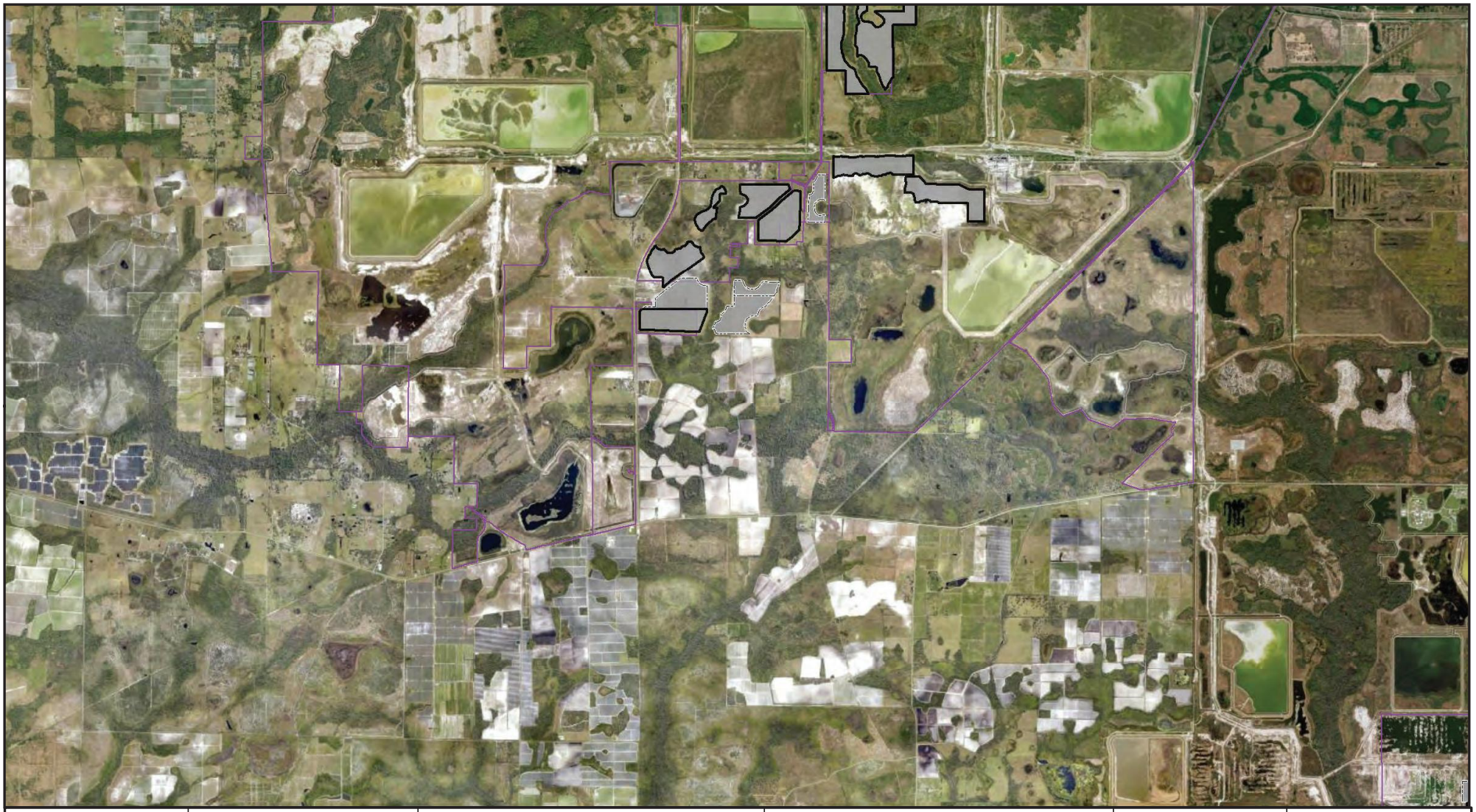
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR PROJECT SITE MAP 1 of 5

FLATWOODS Consulting Group

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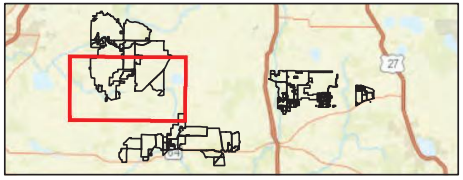
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK MANATEE, HARDEE COUNTIES, FLORIDA

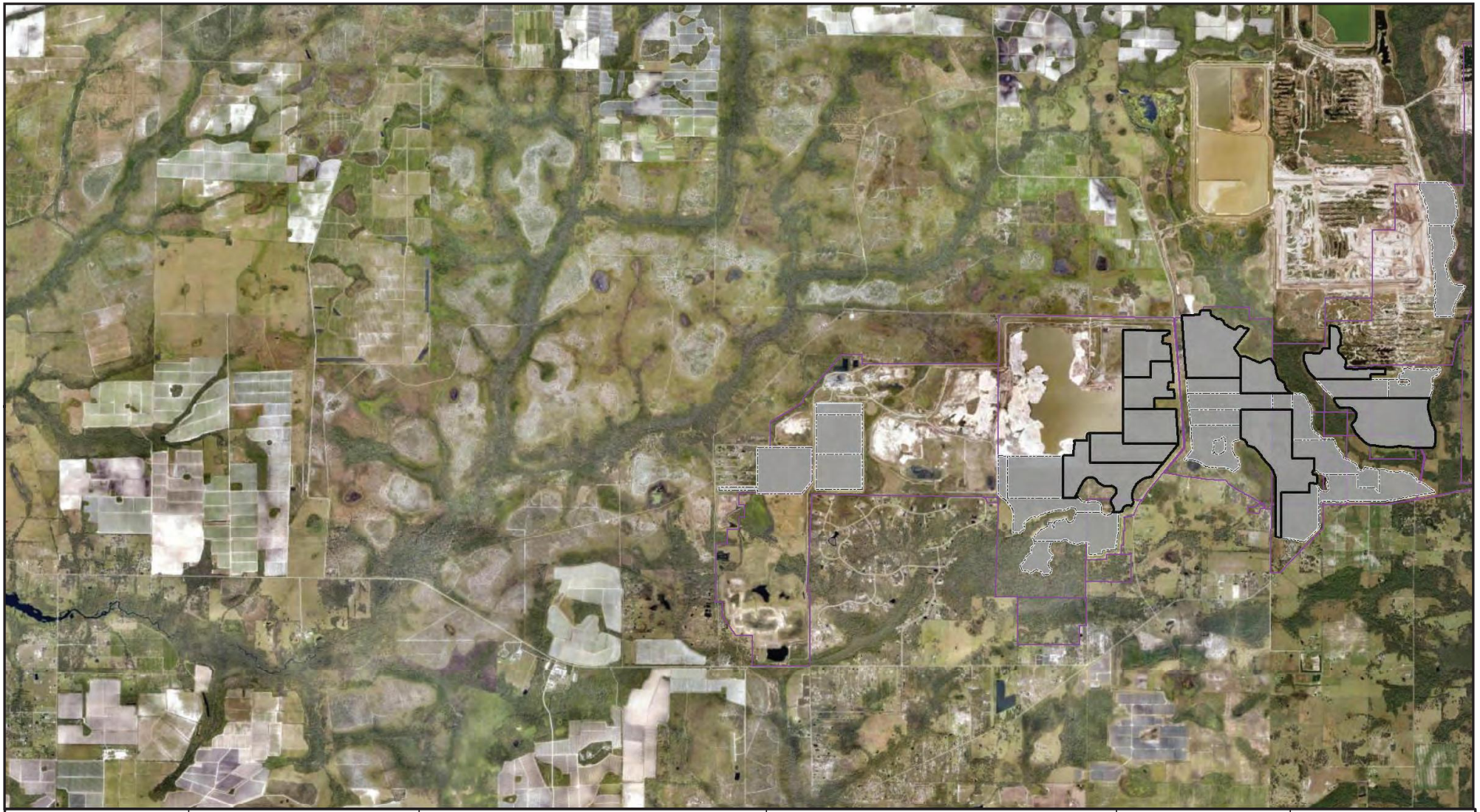
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- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR PROJECT SITE MAP 2 of 5

FLATWOODS Consulting Group

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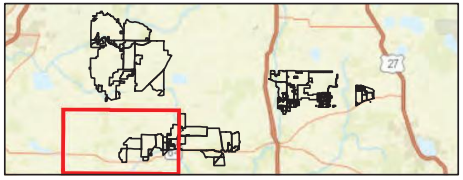
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MINE-WIDE FLORIDA
SOUTHEASTERN AMERICAN
KESTREL PROGRAMMATIC PERMIT
MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK
MANATEE, HARDEE
COUNTIES, FLORIDA

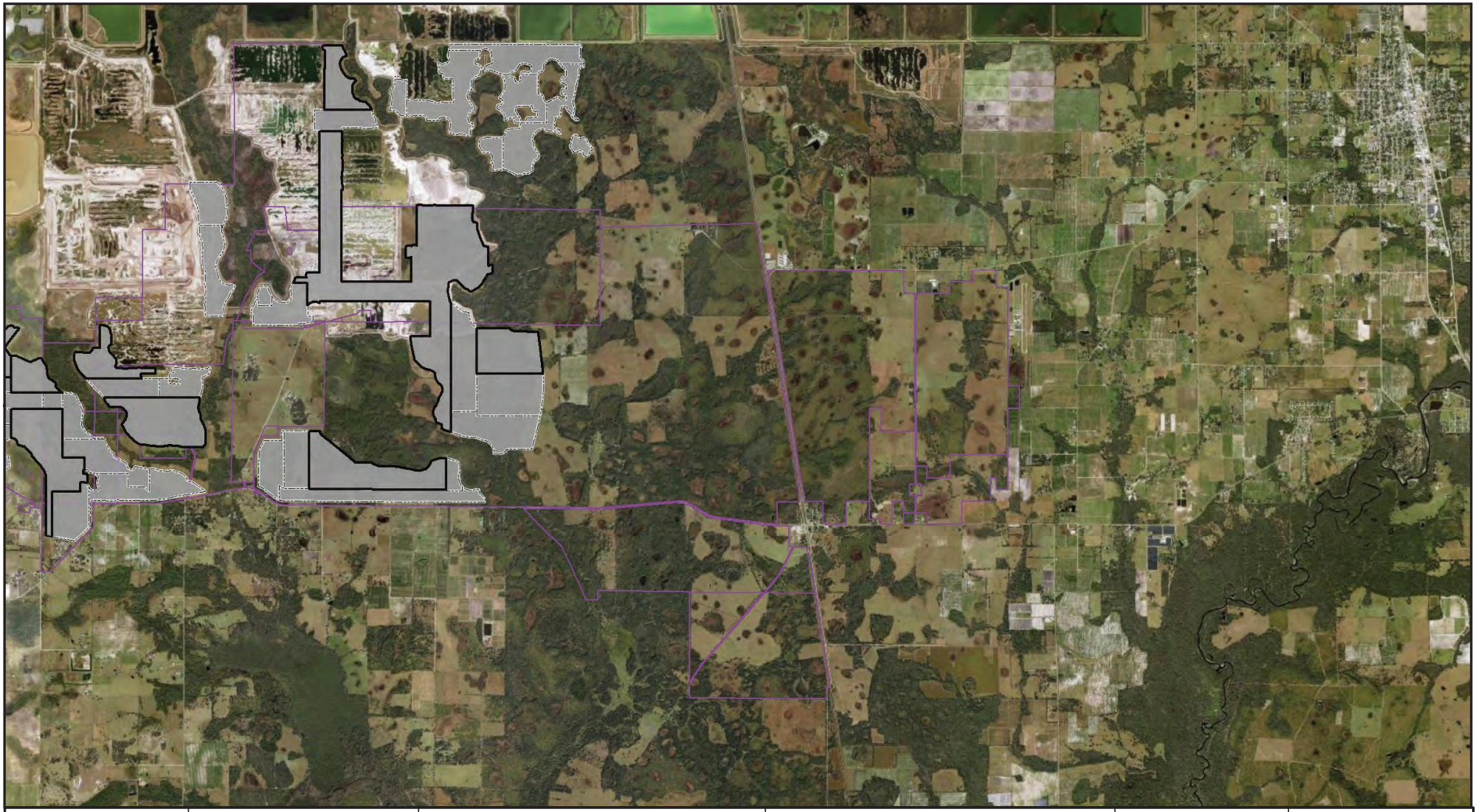
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR
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3 of 5

FLATWOODS
Consulting Group

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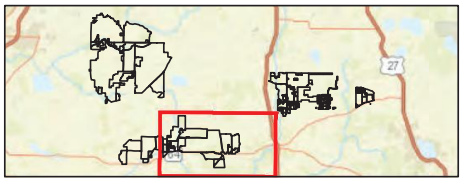
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK MANATEE, HARDEE COUNTIES, FLORIDA

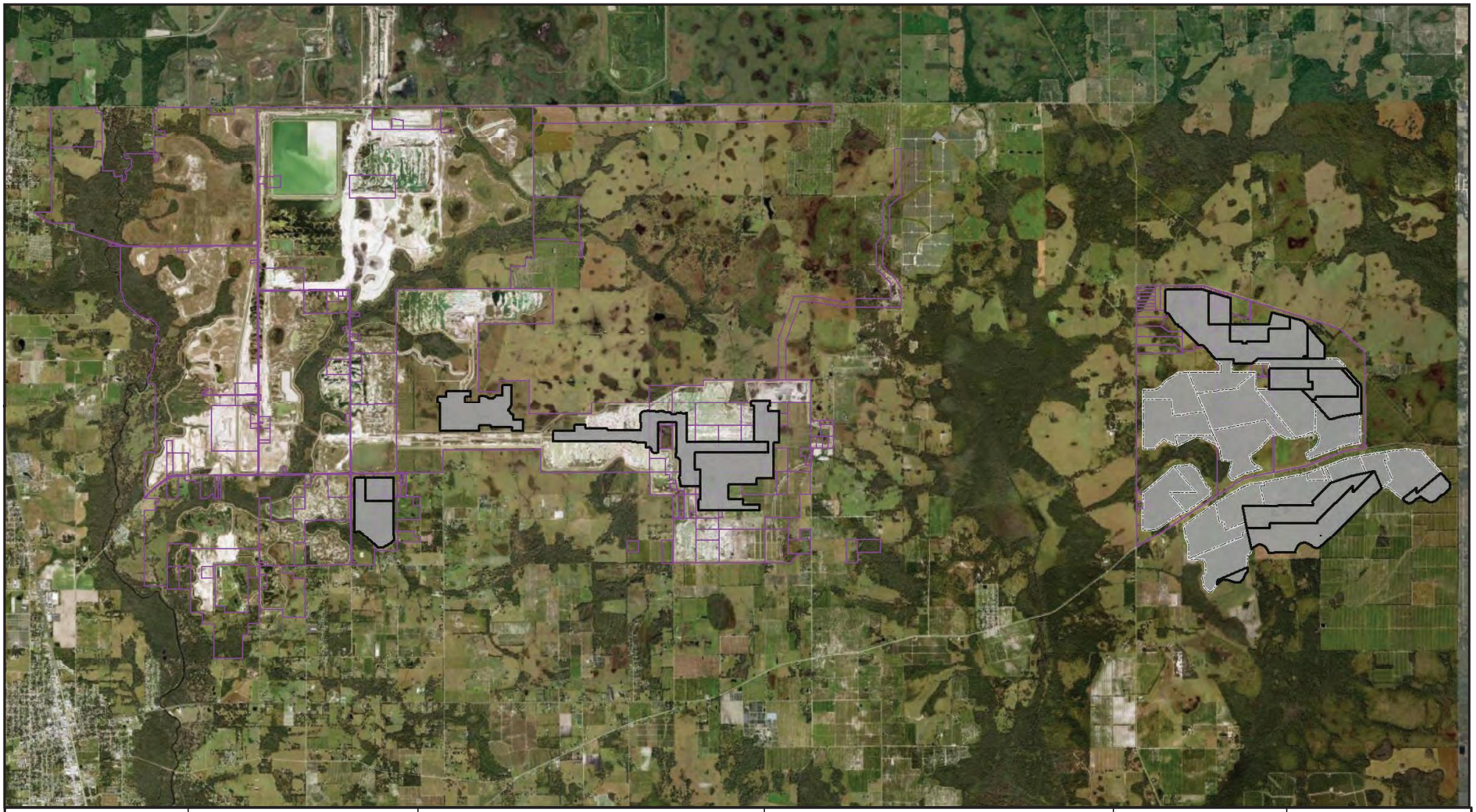
- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR PROJECT SITE MAP 4 of 5

FLATWOODS Consulting Group

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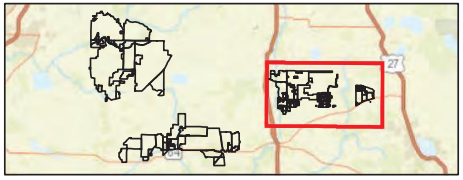
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MINE-WIDE FLORIDA
SOUTHEASTERN AMERICAN
KESTREL PROGRAMMATIC PERMIT
MOSAIC FERTLIZER LLC

HILLSBOROUGH, POLK
MANATEE, HARDEE
COUNTIES, FLORIDA

- 5 Year Mine Plan - 6,943.5 ac.
- 15 Year Mine Plan - 13,620.4 ac.
- Future Mine Plan



15-YEAR
PROJECT
SITE MAP
5 of 5

FLATWOODS
Consulting Group

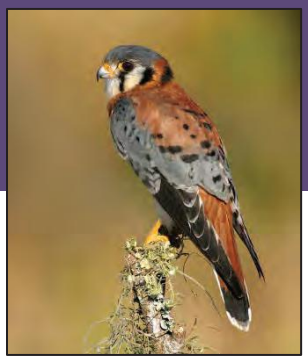
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Exhibit C

Southeastern American Kestrel Species Conservation Measures and Permitting Guidelines

Southeastern American Kestrel

Falco sparverius paulus



Photograph by Jack Rogers.

Overview

Status: Listed as state Threatened on Florida's Endangered and Threatened Species list.

Current Protections

- 68A-27.003 (2)(a), F.A.C. No person shall take, possess, or sell any threatened species included in this subsection or parts thereof or their nests or eggs except as authorized by Commission rule or by permit from the Commission or when such conduct is authorized in a management plan as defined in this chapter and approved by the Commission, or as authorized in Commission-approved guidelines.
- 68A-27.001(4), F.A.C. Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.
- Southeastern American kestrels, active nests, eggs, and young are also protected under the Federal Migratory Bird Treaty Act and state Rule 68A-16.001, F.A.C.
- 68A-16.006, F.A.C., prohibits the use, placement, and possession of bird traps without the appropriate authorization.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support essential behaviors for the southeastern American kestrel, threats faced by the species, and what constitutes significant impairment and disruption of essential behaviors.

The southeastern American kestrel (*Falco sparverius paulus*) is a non-migratory subspecies of the American kestrel found in sandhill and open pine savannahs, scrub, pastures, and fields in central and north Florida (see Distribution and Survey Methodology). Males and females are sexually dimorphic: males have blue-gray wings and a rufous tail whereas females have barred black and rufous wings and tail. Juveniles are similar in appearance to adults with heavier streaking on chest, though juveniles are difficult to distinguish from female adults (Smallwood and Bird 2020).

The southeastern American kestrel is one of two subspecies found in Florida. The northern subspecies (*F. S. sparverius*) migrates to Florida during the nonbreeding season. The two subspecies cannot reliably be distinguished by plumage in the field (Collopy 1996), and identification of southeastern American kestrels can only be confirmed when the migrant subspecies is not in Florida (April – August, although some migrants may still be in Florida in early April; Fink et al. 2020).

In Florida, the southeastern American kestrel breeding season extends from March 1 to July 31, although young have been known to fledge as late as early August (Smallwood and Bird 2020, FWC unpublished data).

Southeastern American kestrels nest in cavities created by other species, where females typically lay 3 to 5 eggs per clutch. Incubation lasts for 29 to 31 days, and young fledge 28 to 30 days after hatching (Smallwood and Bird 2020). Newly fledged American kestrels may use the nest cavity for roosting for up to 12 nights (Balgooyen 1976), and adults continue to feed young up to 12 days post-fledging (Bird and Palmer 1988).

Habitat Features that support essential behavioral patterns

The southeastern American kestrel (hereafter, kestrel) requires large, connected areas of Suitable Foraging Habitat (see definition) to successfully breed and raise young. Foraging habitat characteristics include open, low vegetation dominated by grasses, minimal tree canopy cover (0-25%), and available perches for hunting (Smallwood and Collopy 2009, Miller et al. 2019). Sandhill habitat features that support red-cockaded woodpeckers (*Leuconotopicus borealis*) also support kestrels (Gault et al. 2004). Kestrels prefer frequently burned sandhill communities but will also use grassland, pasture, and agricultural areas (Bohall-Wood and Collopy 1986, Smallwood and Bird 2020) and recently burned scrub consisting of low scrub oaks (*Quercus* spp.) with interspersed sandy patches (Beatty et al. 2020). Kestrels also forage within ephemeral wetlands embedded in uplands during periods when the wetlands are dry, given the area is open with low vegetation (Jennifer Myers, FWC, personal communication).

Kestrels mainly hunt by searching for prey from a perch and will use natural and human-made structures (e.g., utility wires, irrigation structures, buildings, fences, and poles) as perches. Kestrels can also hunt via hovering in place; however, this method demands more energy compared to perch hunting (Rudolph 1982). Southeastern American kestrels prey mostly on grasshoppers and lizards, but also consume other invertebrates and occasionally small mammals (Bohall-Wood and Collopy 1986).

Kestrels are obligate secondary cavity nesters; they mostly depend on woodpeckers to excavate cavities for nesting and roosting. However, they will also use cavities caused by rot or fallen limbs. Excavated nest cavities are usually in dead pine and oak trees. Nesting can occur in cavities in living pines (Gault et al. 2004) but rarely occurs in living oaks (Smallwood and Bird 2020). Kestrels readily use nest boxes, though hatching success is low if nest material is not supplied (Varland and Loughin 1993). Kestrels have also been documented nesting in building eaves, wooden utility poles, and metal transmission cross-arms (Smith et al. 1972, Beasley and Parrish 2009, Smallwood and Collopy 2009, Tracey and Miller 2018). Nest cavities are often reused the following breeding season (Gault et al. 2004, Katzner et al. 2005) and are used as roost sites during the non-breeding season (Toland and Elder 1987, Health and McClure 2017).

Kestrels maintain territories during the breeding season. Territories may overlap depending on habitat quality and kestrel density (Smith et al. 1972). Young kestrels tend to disperse to Suitable Foraging Habitat (see definition) near their natal site (Miller and Smallwood 1997). Territory size for American kestrels is not widely studied (Smallwood and Bird 2020), but observations range from an average diameter of 0.41 mi (0.66 km; in Jamaica; Cruz 1976), 0.50 mi (0.80 km; in Utah; Smith et al. 1972), and 1.5 mi (2.41 km; in Michigan and Wyoming; Craighead and Craighead 1956). The variation in territory size may be due to prey abundance, habitat quality, nest cavity availability, and breeding pair density (Village 1982, Bowman and Bird 1986, Smallwood and Bird 2020). In Florida, Bohall-Wood and Collopy (1968) found that in high quality habitat, such as sandhill, kestrels were observed most frequently on territories of 124 ac (50 ha), but in lower quality habitat, a kestrel pair may require a larger foraging area.

Threats

Southeastern American kestrels have experienced an estimated population decline of 82% in north central Florida since the 1940s (Hoffman and Collopy 1988). More recently, nest box occupancy rates in a long-term study site in Levy and Marion counties declined by over 50% (Smallwood et al. 2009*a*). A single cause has not clearly been identified for kestrel population declines (Smallwood et al. 2009*a*, McCure et al. 2017), and declines are likely a combination and interaction of many threats. As noted in A Species Action Plan for the

Southeastern American Kestrel (FWC 2013), primary threats include habitat loss, habitat degradation from fire suppression, and habitat fragmentation. Fire suppression reduces habitat quality and quantity (i.e., via mid-story encroachment) and thus reduce available suitable nest sites (i.e., cavities) for kestrels (Smallwood and Collopy 2009). Habitat fragmentation has both large-scale and small-scale impacts on kestrels. In Florida, habitat fragmentation at the territory scale (0.31-mi radius) negatively influences persistence of breeding pairs at the site (Brown et al. 2013). In the migratory subspecies, breeding pairs are less likely to occupy nest boxes in small habitat-patches compared to large ones (Smallwood et al. 2009*b*). At larger scales, fragmentation means that kestrels are unlikely to colonize vacant habitat, due to their relatively short dispersal distances in Florida (median <3 mi, Miller and Smallwood 1997).

Human-related disturbance is an additional threat for kestrels. American kestrels have shown tolerance of brief disturbances (e.g., activities related to scientific study including opening nest boxes and handling chicks; Smallwood 2016). However, continuous human disturbances have been correlated with increased female stress and lower productivity (Strasser and Health 2013). When combined with food-stress, even brief disturbances near the nest cavity cause lower productivity (Carpenter 1993). Stys (1993) recommends a 490-ft buffer (150-m; rounded from 492 ft) around cavities with active kestrel nests to avoid disturbing the breeding pair. Human-related disturbances within 490 ft of an Active Nest Cavity are anticipated to significantly disrupt kestrels' ability to breed and thus expected to cause take via harassment.

In addition to threats described above, American kestrels are vulnerable to secondary poisoning by certain rodenticide and, agriculture pesticides, as well as sensitivity to flame retardants used in manufacturing consumer products (Bird 2009, Fernie et al. 2009, Smallwood and Bird 2020). Pesticides also reduce the kestrel's main prey base (Smallwood and Bird 2020). Kestrels are also vulnerable to collisions with vehicles (Deem et al. 1998) and windows (Hager 2009). The Species Action Plan for Southeastern American Kestrel (FWC 2013) includes actions to address many of the threats facing the species.

Potential to Significantly Impair Essential Behavioral Patterns

Kestrels depend on cavities for nesting and sheltering. Removal of Active Nest Cavities (see definition) directly harms eggs and young. Removal of previously used nest cavities can result in take via harassment by significantly disrupting breeding and sheltering activities. Disturbance near Active Nest Cavities during the breeding season can result in take via harassment by lowering productivity and significantly disrupting breeding. Southeastern American kestrels require large areas of Suitable Foraging Habitat (see definition) within their breeding territory; significant habitat modification that reduces available habitat within their breeding territory can cause take by impairing the essential behaviors of foraging and breeding.

Take of Southeastern American Kestrels

This section describes what constitutes take, as defined in Chapter 68A-27, F.A.C., of southeastern American kestrels(see Current Protections). For ways to avoid take (and thus avoid the need for an FWC permit), see Measures to Avoid Take. Take of kestrels can be either incidental or intentional. **Incidental take** of state-Threatened species is take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity, and it is prohibited without an incidental take permit or other authorization. Accidental death or injury of a kestrel caused by construction activity is an example of incidental take. **Intentional take** is take that is not incidental to an otherwise lawful activity and is prohibited without a permit. For southeastern American kestrels, intentional take permits may be issued for scientific collecting and falconry. Capturing and handing kestrels for research is an example of intentional take requiring a scientific collecting permit.



Figure 1: Examples of Active Nest Cavities. Photographs: FWC/FWC Permit Files

Defining take for the southeastern American kestrel requires an understanding of features that support kestrel breeding, feeding, and sheltering. The following terms define those key features:

- **Suitable Cavity:** Suitable Cavities are hollow spaces within a tree or man-made structure that can support kestrel breeding and sheltering during or outside of the breeding season. Suitable Cavities are usually unobstructed by vegetation with an entrance hole roughly 3 in in diameter and located at least 10 ft (3 m) from the ground. Suitable Cavities can be found in living or dead trees, most commonly pine, but may also be in dead oak, cabbage palm, or decaying limbs on live trees (see Figure 1). Examples of man-made structures that support Suitable Cavities include building eaves, wooden power poles, and nest boxes**.** Less common but documented locations of Suitable Cavities for kestrels include the cross-arm of large metal transmission lines (Maney and Parrish 2007, Beasley

and Parrish 2009) and the bottom of monk parakeet (*Myiopsitta monachus*) stick nests (Tracey and Miller 2018).

- **Active Nest Cavity:** A Suitable Cavity is considered an Active Nest Cavity while it supports breeding, which occurs from the point of cavity selection to incubation and rearing of dependent chicks. Prior to eggs being laid during the breeding season (March 1 to July 31), cavity selection can be determined if one or both kestrels are seen entering, exiting, or sitting inside the cavity.



Figure 2: Example of Suitable Foraging Habitat. FWC photo by Craig Faulhaber.

- **Inactive Nest Cavity**: After the young have fledged or once the breeding season is over, an Active Nest Cavity is considered an Inactive Nest Cavity**.** Kestrels will re-use Inactive Nest Cavities in multiple subsequent breeding seasons and will use Inactive Nest Cavities outside of the breeding season for sheltering. Inactive Nest Cavities are valuable if kestrels continue to occupy that territory.
- **Suitable Foraging Habitat:** Suitable Foraging Habitat is found in the following landcover classes: high pine and scrub (scrub 1210, upland coniferous 1230, sandhill 1240), mowed grass (1810), low intensity urban (urban open pine 182112, grass 18213), rural (rural open pine 18312, agriculture - cropland/pasture 18331). Within the landcover types above, Suitable Foraging Habitat consists of either (1) open, low vegetation (≤10 in) dominated by grasses or (2) low scrub oaks with interspersed sandy patches. In pine-dominated forests or sandhill communities, canopy cover in Suitable Habitat is less than 40%, with 25% or less being optimal (i.e., on an aerial image, the ground is easily visible between trees; Figure 2). The landcover terminology used above comes from the Florida Landcover Classification System (Kawula and Redner 2018), which crosswalks to the Florida Land Use Cover and Forms Classification System (FLUCCS).
- **Habitat Use Centroid:** The center point of documented kestrel foraging use. This is the average position of observed kestrel locations recorded from surveys (see Appendix A). The Habitat Use Centroid is used to estimate the location of a kestrel territory and its associated Suitable Foraging Habitat.

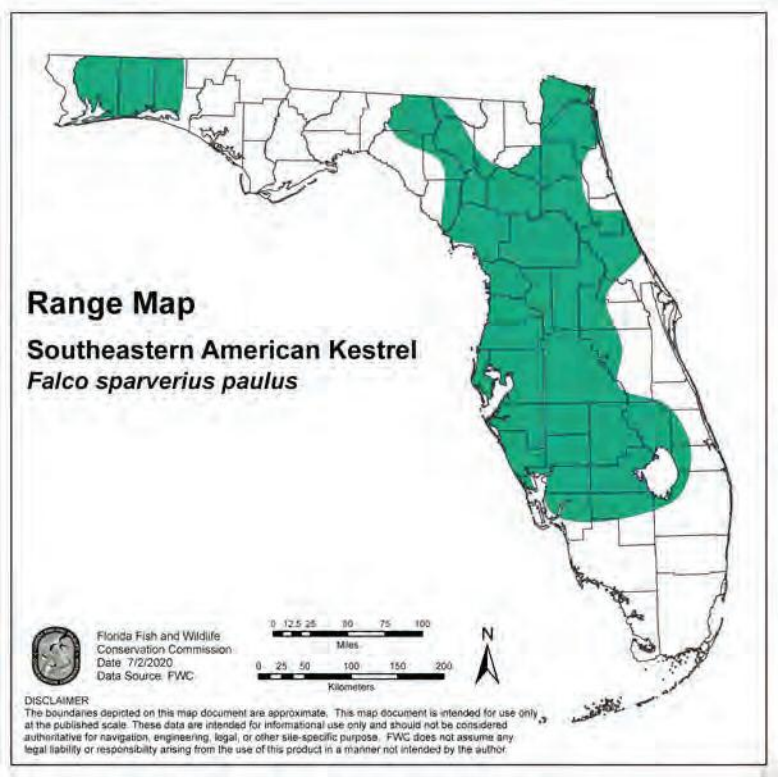
Take of kestrels includes any of the following:

1. Causing injury or death of kestrel adults, eggs, or young.
2. Removing an Active Nest Cavity during the breeding season.

3. Removing an Inactive Nest Cavity (if the cavity is in a man-made structure, see Other Authorizations for Take).
4. Disturbances within 490 ft (150 m) of an Active Nest Cavity are expected to cause take by significantly disrupting or impairing breeding, unless included in Examples of Activities Not Expected to Cause Take.
5. Capturing, handling, or collecting kestrels or their eggs. Examples include banding, attaching auxiliary markers to, and taking blood or other biological samples from kestrels.
6. Significant modification of Suitable Foraging Habitat is expected to cause take. To determine whether an activity will result in significant habitat modification, see Appendix A. Activity that results in reduction of Suitable Foraging Habitat to less than 124 ac (50 ha) within a 0.31-mi (0.50-km) radius around the Habitat Use Centroid is expected to cause take, unless the Suitable Foraging Habitat within the radius was already less than 124 ac, in which case a reduction in foraging habitat does not constitute take. Suitable Foraging Habitat within the radius includes both on-site and off-site habitat. Activities significantly modify kestrel habitat include, but are not limited to, clearing, grading, paving, bulldozing, digging, and construction.

Distribution and Survey Methodology

The map represents the principal geographic range of the southeastern American kestrel based on suitable habitat and known breeding locations. This map is informational only and is not for regulatory purposes.



Counties: Alachua, Bradford, Charlotte, Citrus, Clay, Collier, Columbia, DeSoto, Dixie, Duval, Flagler, Glades, Gilchrist, Hamilton, Hardee, Hendry, Hernando, Highlands, Hillsborough, Indian River, Lafayette, Lake, Lee, Levy, Madison, Manatee, Marion, Martin, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Santa Rosa, Sarasota, Seminole, Sumter, Suwannee, St. Johns, St. Lucie, Taylor, Volusia, and Walton.

Recommended Survey Methodology

Surveys are not required but are highly recommended in Suitable Foraging Habitat to determine if southeastern American kestrels are present and whether an incidental take permit is needed. If southeastern American kestrels are not detected through surveys conducted in accordance with the methodology described below, FWC review or coordination is not needed.

Due to the similar appearance of the migratory American kestrel and the southeastern American kestrel, surveys from April to August are recommended. However, when designing and planning a project, please note that southeastern American kestrels begin breeding in March and may have an Active Nest Cavity as early as March 1st. If surveys must take place outside of the recommended survey window (April to August),

please note that all kestrels observed shall be considered southeastern American kestrels. Surveys are valid until March 1st of the following breeding season.

A minimum of **3 surveys**, with at least 4 to 7 days between each survey, is strongly recommended to determine kestrel use of the project site and to provide sufficient information during the permitting process, if permits are needed.

Survey for kestrels, Suitable Cavities, and Active Nest Cavities (see definitions) by walking 330-ft (100-m) interval transects. The appropriate distance between transects may vary depending on visibility at the site, with transects spaced closer together if forested edges or other obstructions reduce visibility or spaced farther apart if open habitat allows kestrels to be seen at greater distances. If road coverage is extensive with good visibility, transects may be surveyed from a vehicle at a speed of no more than 25 mi (40 km) per hour. Roadside transects may be used if the routes pass through all potential kestrel habitat on the site, and the habitat along the road transects is open enough to allow sighting of individual birds at considerable distances. Surveys on foot are recommended to locate and confirm Active Nest Cavities. Surveys should be conducted during the morning hours, from sunrise to 3-4 hours past sunrise on calm, clear days.

- Record location, date, starting and ending time, observer(s), and weather conditions. Weather conditions that could affect surveys should be recorded: visibility, wind, rain, and temperature.
- When a kestrel is observed, use binoculars and/or a spotting scope to verify identification, record kestrel perch location (GPS or with a rangefinder and reference point) and breeding behavior (e.g., copulation, feeding), sex and age (adult or juvenile). Plot location(s) on map.
  - Kestrels that fly over without landing should be noted but not recorded as a point.
  - Kestrels hunting via hovering should be recorded (GPS location) to determine the Habitat Use Centroid.
- Record GPS coordinates of cavities and classify as a Suitable Cavity, Active Nest Cavity, or Inactive Nest Cavity (see definitions). Note that man-made structures should be included in the survey when these structures contain cavities. Plot location(s) on map.
- All Suitable Nest Cavities should be surveyed for kestrel activity between March 1st and July 31st, (the breeding season).
  - An Active Nest Cavity can be confirmed by observing kestrels entering, exiting, or bringing food to the cavity. If you suspect nesting in an area, minimize disturbance while searching. If kestrels display distressed behaviors, such as alarm calls or circling flights, or if kestrels are perched with food that they are not consuming, back away from the area until normal behavior resumes. Observe with binoculars or scope and watch for kestrels entering and exiting a cavity. Kestrels are more active at the nest cavity at sunrise. Note that the breeding season is March 1st – July 31st, which differs from the survey window.
  - If an Active Nest Cavity is confirmed, surveyors should leave the area quickly and quietly.
  - Active Nest Cavities can be confirmed by kestrel behavior (e.g., entering or exiting the cavity), however, if activity is unclear, one can confirm with a portal nest camera. If an adult is seen in the cavity, the cavity is considered active. Do not attempt to flush the adult to determine if eggs or young are present.
- Repeat the survey at least two more times during the survey season with at least 4-7 days between surveys. Three surveys are recommended even if kestrels are not seen in previous surveys. If kestrels are not documented on site in any survey during the survey season, no further action is needed. Surveys results can be used until the start of the next breeding season (March 1st).
- Map kestrel sightings (kestrels on perches or hunting via hovering, and Active Nest Cavities) to determine Habitat Use Centroid (see Appendix A).

Recommended Conservation Practices

Recommended conservation practices are general measures that could benefit the species but are not required. For additional actions that benefit kestrel conservation, please see the Species Action Plan (FWC 2013).

- Reduce or avoid the use of pesticides, rodenticides, insecticides, and herbicides in kestrel foraging habitat to the extent practicable, especially during the breeding season. Use all products according to label instructions. Pesticides can contaminate or possibly limit the amount of food available for kestrels. American kestrels that have ingested low doses of rodenticides (similar to levels found in scavenged animals) have decreased blood clotting time and reduced fitness, especially if repeatedly exposed (Rattner et al. 2020).
- Maintain low vegetation heights beneficial for kestrel foraging through prescribed burning, prescribed grazing, or mowing.
  - For mowing, rotational mowing of strips creates a combination of taller, dense vegetation and open areas which increases prey numbers (Stys 1993, Sheffield et al. 2001).
  - Burning on a 2 to 3-year rotation will maintain suitable foraging habitat in sandhill and open pinelands, but increased frequency may be needed based on the vegetation on-site.
  - In scrub, stands less than 10 years old should be maintained to have a scrub height of less than 6 ft (2 m) and retaining snags with a diameter at breast height (DBH) greater than 10 in (25 cm) will increase likelihood of kestrel occupancy (Beatty et al. 2020).
- Minimize the amount of foraging habitat converted to more intensive agricultural land uses (e.g., row crops).
- Retain snags in Suitable Foraging Habitat for perches and nest cavities. Prior to prescribed fires, rake around snags to minimize loss of potential nesting sites, especially if the snag is currently occupied by kestrels.
- Maintain at least 2 to 5 perches per ac (4 perches per ha).
  - Optimal perches provide a clear, unobstructed view of foraging habitat and allow kestrels to hunt efficiently. Optimum perch height ranges from 23 to 33 ft (7 to 10 m), however kestrels will use lower perches, such as fence posts, in landscapes that lack taller options (Kim et al. 2003). Examples of optimal perches include utility poles, distribution lines, center pivot irrigation structures, dead trees (snags), and exposed tree limbs.
- Place, monitor, and maintain kestrel nest boxes in Suitable Foraging Habitat (see Appendix B for information on next box design, placement, monitoring, and maintenance).
  - Nest box monitoring is optional, although it provides important information about kestrel populations. Follow the recommended protocol (Appendix B) for voluntary monitoring and reporting to American Kestrel Partnership.
- Manage property to benefit kestrels. For private landowners interested in attracting and managing habitat for kestrels on their properties, the FWC offers Florida's Safe Harbor Program, a voluntary conservation incentive plan, which provides regulatory assurances against future land restrictions in exchange for voluntarily implementing management practices. The FWC's Landowner Assistance Program is also a resource for wildlife habitat management guidance. For more information on these programs, visit MyFWC.com/conservation/terrestrial/safe-harbor and MyFWC.com/conservation/special-initiatives/LAP
- For utility companies:
  - When replacing man-made structures that have Suitable Cavities, provide a nest box or retain the cavity portion of the structure and affix it to the new structure. For example, when replacing utility poles that contain Suitable Cavities:

    - Leave the utility pole up, if safe to do so (wooden utility poles with excavated cavities do not require annual maintenance),
    - Cut the cavity portion out of the pole and affix it to the replacement pole, or
    - Provide a kestrel nest box. Nest boxes must be filled with woodchips or pine straw and maintained annually (see Appendix B).
  - In suitable habitat with powerlines, install and maintain nest boxes at least 0.50 mi (0.80 km) apart. Nest boxes do not have to be monitored but should be inspected annually to replenish woodchips (2 to 3 in [5 to 7.6 cm] deep) as needed.
  - When designing solar fields within kestrel range:
    - Retain Suitable Foraging Habitat to support kestrels by maintaining open grass areas (<10 in [25 cm] tall) with grazing or mowing. Habitat between solar panel rows is not Suitable Foraging Habitat, as it is unclear if breeding kestrels utilize these grassy strips. Grass areas retained as Suitable Foraging Habitat should be large and open, especially if adjacent to other large tracts of Suitable Foraging Habitat.
    - Place a nest box or wooden utility pole with an excavated cavity in an area with at least 124 ac (50 ha) of Suitable Foraging Habitat within a 0.31-mi (0.50- km) radius.
  - Coordinate with organizations and agencies (e.g., managed public lands, local Audubon chapters) to install old wooden poles in Suitable Foraging Habitat or to allow nest boxes to be mounted on existing utility poles in Suitable Foraging Habitat.
- When installing LED lights, use warm-toned LED lights (2200K-3000K) wherever possible to avoid negative impacts to wildlife (Dudley et al. 2015).

Measures to Avoid Take

Avoidance Measures that Eliminate the Need for FWC Incidental Take Permitting

The following measures will eliminate the need for an FWC incidental take permit. For more information on projects that may cause intentional take (e.g., capturing and handling for research, intentional take to ensure human safety), please see FWC Permitting: Intentional Take. Projects may avoid incidental take by:

- Avoiding acts that can kill or injure kestrels or eggs,
- Maintaining a 490-ft (150-m) buffer around Active Nest Cavities during the breeding season (March 1 to July 31) to avoid disturbance,
- Retaining Active and Inactive Nest Cavities in natural structures,
- Maintaining at least 124 ac (50 ha) of Suitable Foraging Habitat within a 0.31-mi (0.50-km) radius of a Habitat Use Centroid.

Examples of Activities Not Expected to Cause Take

This is not an exhaustive list of exempt actions. Please contact FWC staff at the appropriate regional office if you are concerned that you could potentially cause take.

- Conducting surveys for kestrels in accordance with Recommended Survey Methodology.
- Monitoring kestrel nest boxes in accordance with Appendix B: Kestrel Nest Box Placement and Monitoring.
- Mowing within the 490-ft (150 m) buffer of an Active Nest Cavity.
- Routine vegetation maintenance activities within existing utility rights-of-way within 490 ft (150 m) of an Active Nest Cavity, provided the activity is short in duration (1 hour or less).
- Repairs and maintenance on utility lines within 490 ft (150 m) of an Active Nest Cavity, provided the activity is short in duration (1 hour or less) and does not block the cavity entrance.
- Routine maintenance of roads, such as mowing, culvert and sign maintenance, line painting, and other short duration (1 hour or less) activities within 490 ft (150 m) of an Active Nest Cavity. This

does not include road expansion (i.e., creating new lanes, road widening), grading/resurfacing existing roads, or paving an unpaved road.

- Standard vehicular and pedestrian traffic on roads near Active Nest Cavities.
- Take of non-listed migrant American kestrels (*F. s. sparverius*) for falconry, in accordance with Rule 68A-9.005, F.A.C., which specifies birds must be captured between September 15th and January 15th.
- Activities within 490 ft (150 m) from an Active Nest Cavity that are similar in nature, size, duration, and intensity to activities already occurring in comparable proximity. To ensure new activities will not significantly disrupt essential behaviors, existing activities should be carefully documented to demonstrate that new activities are similar.
- Activity that results in reduction of Suitable Foraging Habitat to less than 124 ac (50 ha) within a 0.31-mi (0.50-km) radius around the Habitat Use Centroid (Appendix A), where the Suitable Foraging Habitat within the radius is already less than 124 ac.

Florida Forestry Wildlife BMPs and Florida Agricultural Wildlife BMPs

- Agriculture, as defined in Section 570.02, F.S., conducted in accordance with Chapter 5I-8, F.A.C., and the wildlife best management practices (BMPs) adopted in Rule 5I-8.001 and 5M-18.001, F.A.C., by the Department of Agriculture and Consumer Service pursuant to Section 570.94, F.S., is authorized and does not require a permit authorizing incidental take despite any other provision of Rule 68A-27.007 or 68A-27.005, F.A.C.
- Participation in the Florida Forestry Wildlife BMPs and Florida Agricultural Wildlife BMPs program and implementation of these BMPs provides a presumption of compliance with regard to incidental take of kestrels.

Other Authorizations for Take

- Activities within an airport property in accordance with Rule 68A-9.012, F.A.C.
- As described in 68A-27.007(2)(c), F.A.C., land management activities (e.g., prescribed fire, mechanical removal of invasive species, mowing, disking, roller chopping, and herbicide application) that benefit wildlife and are not inconsistent with FWC Management Plans are authorized and do not require a permit authorizing incidental take.
- Vegetation removal or trimming in the linear right of way for power restoration. This applies only in cases where there is an immediate danger to the public's health and/or safety (including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local government entity), and only to non-routine removal or trimming of vegetation within the linear right of way, in accordance with a vegetation management plan that meets applicable federal and state standards. If conducted under these circumstances, no FWC take permit is required.
- Removal or modification of man-made structures (e.g., utility poles, abandoned buildings) used by kestrels is authorized without a permit, provided the removal is conducted in accordance with the FWC's policy on state-listed species and man-made structures, found in Florida's Imperiled Species Management Plan (ISMP). In accordance with the policy, removal or modification of the structure is authorized without a permit, provided that:
  - An approved Wildlife/Habitat Management Plan (see ISMP) is in place for the area in which the activity will occur, or
  - At least 14 days prior notification is provided to the FWC Wildlife Diversity Conservation Biologist in the region where the activity will occur, no eggs or dependent young are present, and the activity is conducted in such a way to avoid direct physical injury to animals.
- Maintenance or removal of nest boxes is authorized without a permit, provided the repairs or removal occur outside of the breeding season (March 1st to July 31st) when the nest is inactive. This

authorization does not apply to removal of nest boxes installed as mitigation. Permittees needing to remove a nest box installed for mitigation under a valid FWC permit, should contact the FWC's Protected Species Permitting Office.

- To encourage installation of kestrel nest boxes for conservation, **take via significant habitat modification** is authorized within a 0.31-mi (0.50-km) radius of kestrel nest boxes or other cavities installed for the expressed purpose of attracting kestrels under the following circumstances:
  - Nest box installation is coordinated with FWC or a partner program. The nest box is registered with FWC as a Voluntary Conservation Kestrel Nest Box (for instructions how to locate registered nest boxes, see Appendix B), and annual monitoring data is submitted to FWC; or
  - The nest box is installed on a utility company right-of-way. These nest boxes are visible and apparent on the utility poles, and their locations do not need to be reported by the utility company to FWC.

  Significant habitat modification is not authorized within 0.31-mi (0.50-km) radius of kestrel nest boxes installed for mitigation. For a map of nest boxes installed for mitigation, please visit https://geodata.myfwc.com/pages/upland.

Coordination with Other State and Federal Agencies

The FWC participates in other state and federal regulatory programs as a review agency. During review, FWC staff identifies and recommends measures to address fish and wildlife resources to be incorporated into other agencies' regulatory processes. FWC staff provides recommendations for addressing potential impacts to state listed species in permits issued by other agencies, including comments on avoidance and permitting for kestrels. If permits issued by other agencies adequately address all the requirements for issuing a state-Threatened species take permit, the FWC will consider these regulatory processes to fulfill the requirements of Chapter 68A-27, F.A.C., with a minimal application process. This may be accomplished by issuing a concurrent take permit from the FWC, by a memorandum of understanding with the cooperating agency, or by a programmatic permit issued to another agency. These permits would be issued based on the understanding that implementation of project commitments will satisfy the requirements of Rule 68A-27.003 and 68A-27.007, F.A.C.

Review of Land and Water Conversion Projects with State-Listed Species Conditions for Avoidance, Minimization and Mitigation of Take

- FWC staff, in coordination with other state agencies, provides comments to federal agencies on federal actions, such as projects initiated by a federal agency or permits under review by a federal agency.
- FWC staff works with landowners, local jurisdictions, and state agencies such as the Department of Economic Opportunity on large-scale land use decisions, including long-term planning projects like sector plans, projects in Areas of Critical State Concern, and large-scale comprehensive plan amendments.
- Conservation benefit as defined in the ISMP may be accomplished through avoidance, minimization, and mitigation measures outlined in an Environmental Resource Permit, provided sufficient Suitable Cavities and Suitable Foraging Habitat occur on the mitigation site, and there is a commitment to manage the habitat in a manner suitable for kestrels.

FWC Permitting: Incidental Take

According to Rule 68A-27.001, F.A.C., incidental take is take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Activities that result in impacts to kestrels can require an incidental take permit from the FWC (see above for activities that do not require a permit). Incidental take permit

applications are available on the Protected Species Permitting Website, currently under the permit name "migratory bird nest removal." The applicant must be the landowner, or an agent designated in writing by the landowner.

In addition to state permits, the applicant is responsible for acquiring any necessary local or federal authorizations. Federal permits may be required from the U.S. Fish and Wildlife Service to comply with the Migratory Bird Treaty Act (16 USC 703-712). For example, removing an active nest (i.e., a nest with eggs or young) may require a federal permit in addition to the state permit. Please be aware that the FWC typically does not issue permits for removal of active nests except in situations involving health and human safety, and issuance of a state permit does not constitute federal authorization.

Permits may be issued when there is a scientific or conservation benefit to the species and only upon showing by the applicant that that the permitted activity will not have a negative impact on the survival potential of the species. Scientific benefit, conservation benefit, and negative impacts are evaluated by considering the factors listed in Rule 68A-27.007(2)(b), F.A.C. These conditions are usually accomplished through a combination of avoiding take when practicable, minimizing take that is unavoidable, and mitigating for the permitted take. This section describes the minimization measures and mitigation options available as part of the incidental take permit process for take of kestrels. This list is not an exhaustive list of options.

Minimization Measure Options

The options below are intended to address the evaluation factors required for consideration when issuing an incidental take permit. These options can lessen the impact of activities, and ultimately may reduce what is needed to achieve a conservation or scientific benefit.

Seasonal, Temporal, and Buffer Measures

- Avoid conducting project activities during the breeding season (March 1st – July 31st).
- If activities must be conducted during the breeding season within 490 ft (150 m) of Active Nest Cavities:
  - Minimize the noise and duration of activities
  - Avoid activities that block the entrance to the nest or create obstacles as kestrels fly in and out of the nest
- Conduct project activities during daylight hours to avoid bright lighting and disturbance within 490 ft (150 m) of Active Nest Cavities.

Design Modification

- Avoid impacts to natural cavities onsite where possible.
- Avoid impacts to as much Suitable Foraging Habitat as possible within 0.31-mi (0.50 km) radius of the Habitat Use Centroid to minimize the impacts of conversion to incompatible land uses.
- If it is not possible to avoid impacts to as much Suitable Foraging Habitat as possible within 0.31-mi (0.50 km) radius of the Habitat Use Centroid, avoidance of sufficient Suitable Foraging Habitat outside of the radius is beneficial as it provides habitat for the displaced kestrels to use.
- Maintain grassy, open areas (through mowing, prescribed grazing, or prescribed fire) within remaining Suitable Foraging Habitat at less than 10 in (25 cm) after the completion of project activities.

Method Modification

- Provide pre-construction training about kestrel protections to contractors, sub-contractors, and other project personnel.
- Minimize noise and duration of activities within 490 ft of Active Nest Cavities.

Mitigation Options

Mitigation is scalable depending on the impact, with mitigation options available for take that significantly impairs or disrupts essential behavioral patterns. This list of mitigation options is not exhaustive. For scenarios that do not fit these categories, stakeholders may contact the FWC's Protected Species Permitting Office for technical assistance. Programmatic permits are possible and will be evaluated on a case-by-case basis.

Mitigation for Harassment at an Active Nest Cavity

Disturbance within 490 ft (150 m) of an Active Nest Cavity during the breeding season is expected to result in take via harassment by lowering productivity and significantly disrupting breeding. Examples include construction activities, road construction and widening, and prolonged operation of large or loud machinery. Permit applicants may select *one* of the following options:

1. A financial contribution to the Fish and Wildlife Foundation of Florida's Imperiled Species Permitting Conservation Fund in the amount of $1,500 per each kestrel pair harassed.
2. Installation and maintenance of 1 kestrel nest box for each kestrel pair harassed. The objective of this mitigation is to offer a supplemental cavity that may outlast a natural one and to add another choice for sheltering and breeding.
    a. Kestrel nest boxes must be installed in Suitable Foraging Habitat and maintained for minimum of 3 years in accordance with Appendix B.
    b. Vegetation shall be maintained (e.g., mowing, grazing) within 100 ft of the nest box for the duration of the permit.
    c. Permittees must maintain the nest box by annually cleaning and replenishing nesting material as described in Appendix B for the duration of the permit.
    d. During the annual maintenance, evidence of kestrel nesting (i.e., droppings on the interior walls of the nest box) or nesting by another species must be noted and reported in the annual report.
    e. Permittee must provide an annual report to FWC's Protected Species Permitting Office for the duration of the permit, according to the template provided by the FWC's Protected Species Permitting Office.
3. Off-site mitigation using a kestrel box provided the following conditions are met:
    a. The off-site mitigation area has been approved by the FWC. This may necessitate a site visit by FWC staff, at the discretion of the FWC.
    b. The applicant can demonstrate that the site is within the kestrel's range (see Distribution and Survey Methodology) and contains sufficient Suitable Foraging Habitat to support breeding (adjacent properties can count towards sufficient foraging habitat).
    c. Kestrel nest boxes must be installed in Suitable Foraging Habitat and maintained for minimum of 3 years in accordance with Appendix B.
    d. Vegetation must be maintained (e.g., mowing, grazing) within 100 ft of the nest box for the duration of the permit.
    e. Permittees must maintain the nest box by annually cleaning and replenishing nesting material as described in Appendix B for the duration of the permit.
    f. During the annual maintenance, evidence of kestrel nesting (i.e., droppings on the interior walls of the nest box) or nesting by another species must be noted and reported in the annual report.
    g. Permittee must provide an annual report to FWC's Protected Species Permitting Office for the duration of the permit, according to the template provided by the FWC's Protected Species Permitting Office.

Mitigation for Removal of an Inactive Nest Cavity

Removal of an Inactive Nest Cavity disrupts future breeding behaviors and sheltering outside of the breeding season (see Other Authorizations for Take for man-made structures). Mitigation options include providing *one* of the following:

1. A financial contribution to the Fish and Wildlife Foundation of Florida's Imperiled Species Permitting Conservation Fund in the amount of $6,000 per Inactive Nest Cavity removed.
2. Installation of 2 kestrel nest boxes on site, plus $500 to the Fish and Wildlife Foundation of Florida's Imperiled Species Management Fund.
    a. Kestrel nest boxes must be installed in Suitable Foraging Habitat and maintained for minimum of 5 years in accordance with Appendix B. For the first 3 years, the kestrel nest boxes must also be monitored in accordance with Appendix B.
        i. Permittees must maintain the nest box by annually cleaning and replenishing nesting material as described in Appendix B for the duration of the permit.
    b. Vegetation must be maintained (e.g., mowing, grazing) within 100 ft of the nest box for the 5-year duration of the permit.
    c. During the annual maintenance, evidence of kestrel nesting (i.e., droppings on the interior walls of the nest box) or nesting by another species must be noted and reported in the annual report.
    d. Permittees must provide an annual report each year for the 5 years according to the template provided by the FWC's Protected Species Permitting Office. Note that this template differs from the one for harassment at an Active Nest Cavity.
3. Off-site mitigation using 2 kestrel boxes and a financial contribution as described in option 2, provided the following conditions are met:
    a. The off-site mitigation area has been approved by the FWC. This may necessitate a site visit by FWC staff, at the discretion of the FWC.
    b. The applicant can demonstrate that the site is within the kestrel's range (see Distribution and Survey Methodology) and contains sufficient Suitable Foraging Habitat to support breeding. (Adjacent properties count towards sufficient foraging habitat).

Mitigation for Significant Habitat Modification

Mitigation for project activities that result in significant habitat modification will be evaluated on a case-by-case basis. Permits will not be issued solely for proposed infrastructure (e.g., roads and utilities) that is part of a larger common development plan, project, plat, or subdivision. Mitigation must address all kestrels impacted through the entire project, development, plat, or subdivision site plan (the development footprint). Mitigation packages may seek to meet either scientific or conservation benefit and may include one of the following options or a combination of options:

Scientific Benefit

This section describes research and monitoring activities that provide scientific benefit, per Rule 68A-27.007, F.A.C. Conducting or funding these activities can be the sole form of mitigation for a project.

- Research assessing kestrel population size and movements on utility transmission corridors.
- Research on the effects of conversion of pastures to solar facilities on kestrel occupancy and demography.
- Research assessing the population status, demographics, and reproductive health of kestrels in human-modified landscapes.

Habitat

Habitat protection, restoration, or management must be sufficient to counterbalance the take that occurs and provide an additional benefit. For example, if take includes one pair of kestrels, then a restoration project would need to provide sufficient Suitable Foraging Habitat and Suitable Cavities, either on its own or in conjunction with existing suitable habitat, to support at least one pair of kestrels that would not otherwise have been present. Habitat-based mitigation can be either on- or off-site.

- Restoration of sandhill habitat on public or private conservation land large enough to support kestrels and within kestrel range. Restoration activities include prescribed fire, timber thinning, hardwood reduction, removal of invasive plant species, and ground cover restoration.
- On-site preserve areas that protect Suitable Foraging Habitat and provide Suitable Cavities (e.g., nest boxes) for breeding and sheltering, along with a commitment for management with a habitat management plan. Other developed land may contain Suitable Foraging Habitat but should not be included as part of the preservation area. Residential lawns, isolated narrow grassy strips along roads and medians, and areas adjacent to high traffic roads are not Suitable Foraging Habitat and should not be included in on-site preserves for kestrels.
- Short-term or long-term commitment to use habitat management techniques that maintain Suitable Foraging Habitat in areas with sufficient Suitable Foraging Habitat and Suitable Cavities.
- Fee simple acquisition or conservation easements of potential habitat, with a commitment for long-term management and a habitat management plan, in areas within kestrel range with sufficient Suitable Foraging Habitat and Suitable Cavities.

Financial Contribution

- A financial contribution to the Fish and Wildlife Foundation of Florida's Imperiled Species Permitting Conservation Fund in the amount of $20,000 per kestrel pair taken via significant habitat modification.
- The amount of mitigation for this category can be reduced as impacts are reduced through minimization options, or by combining other mitigation options with a financial contribution.

Information

- FWC-approved research, monitoring, or educational projects consistent with the Species Action Plan for Southeastern American Kestrel (FWC 2013). This form of mitigation can be part of a mitigation package but shall not be the sole form of mitigation unless included above under Scientific Benefit.

Table 1: Summary of Mitigation Options

Form of Take	Mitigation Options		
	Combination	**Permit Duration**	**Financial Only** (Per nest cavity or kestrel pair)
Harassment of nesting pair (activities within 490-ft buffer of an Active Nest Cavity)	Install and maintain 1 nest box for 3 years ** (no monitoring requirement)	3 years	$1,500
Removal of Inactive Nest Cavity* (foraging habitat remains)	Install and maintain 2 nest boxes for 5 years + $500 (monitor only for first 3 years, but maintain all 5 years)	5 years	$6,000
Significant habitat modification (may also include removal of nest cavity)	1. Scientific benefit, or 2. Habitat restoration, acquisition, or conservation easements, or 3. Combination of two or more of the options below: (a) research, monitoring, educational projects; (b) habitat restoration, land acquisition, or conservation easements; or (c) financial mitigation	Varies	$20,000

*Excludes cavities in man-made structures, see Other Authorizations for Take

** Nest boxes may be placed on-site or FWC approved off-site locations

Programmatic Options

- Multi-year or long-term permits are possible and will be considered on a case-by-case basis. Examples include, but are not limited to, large-scale ecological restoration projects or public works projects.

Multispecies Options

- Multispecies mitigation options may be available for projects that will also impact gopher tortoises and state-listed species commensal to the gopher tortoise.

FWC Permitting: Intentional Take

Intentional take is not incidental to otherwise lawful activities. Per Chapter 68A-27, F.A.C., intentional take is prohibited and requires a permit. For state-Threatened species, intentional take permits may only be considered for scientific or conservation purposes (defined as activities that further the conservation or survival of the species taken). Permits are issued for state-Threatened species following guidance in Rule 68A-27.007(2)(a), F.A.C. Intentional take is authorized under certain circumstances that involve risks to

property or human safety, such as on airport property.

Risks to Property or People

Intentional Take for Human Safety

- Rule 68A-9.012, F.A.C., describes circumstances under which kestrels may be taken on airport property without further state authorization for an imminent threat to aircraft or human safety.
- Permits for intentional take will be issued only under limited and specific circumstances, in cases where there is an immediate danger to the public's health and/or safety, including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity. Applications submitted for this permit must include all information that is required from any other applicant seeking a permit, along with a copy of the official declaration of a state of emergency, if any.

Aversive Conditioning

- Not applicable for the southeastern American kestrel.

Scientific Collecting and Conservation Permits

Scientific collecting permits may be issued for the kestrel using guidance found in Rule 68A-27.007(2)(a), F.A.C. Applicants can find guidance for applying for scientific collecting permits on FWC's Protected Species Permitting Website.

Research activities requiring a permit include any projects that involve capturing, handling, or marking kestrels; conducting biological sampling; or other activities that may cause take. The information in this section is intended to support the development of complete and sufficient applications.

Scientific collecting permit applications involving **captive possession** for any period of time must include a description of the facility's appropriate resources to accomplish the project's objectives and maintain the animals in a safe and humane manner.

Scientific collecting permit applications for **educational use** of live kestrels must include an evaluation by an independent rehabilitator and a veterinarian demonstrating that the individual cannot be released into the wild, must demonstrate appropriate educational use by describing the activities in which the kestrel is used for education or the exhibits that display the kestrel, and must include information about the ability of the applicant(s) to conduct the educational activities, and their history of performing such activities. Applications should demonstrate that the kestrel will be on public display with the intent of conservation education whenever the facility is open to the public (provided the bird is in good health) or through scheduled tours.

For **possession of dead kestrels, or their parts or infertile eggs**, an applicant must meet appropriate educational use as designated above, except that specimens may be housed in a manner appropriate for their preservation, provided they are still accessible for public use. Permits may be issued to display a specimen if the specimen was obtained via a rehabilitation facility or was encountered dead.

Falconry permits for southeastern American kestrels require an intentional take permit and would only be considered for activities that further the conservation or survival of the species.

Although issuance of a state permit does not depend on the possession of **local or federal authorizations**, permittees must obtain all necessary local and federal authorizations before executing the state permit. Federal permits may be required from the U.S. Fish and Wildlife Service to comply with the Migratory Bird Treaty Act and may be required from the United States Geological Survey (USGS) Bird Banding Lab for banding, color-marking, specific capture methods, sampling of blood or tissues, collection of feathers, and attachment of transmitters or other data gathering mechanisms. Federal salvage permits are also required to collect any dead individuals (i.e., mortality not due to research activities or incidental take from research

activities) or parts of deceased individuals including feathers and tissues.

Considerations for Issuing a Scientific Collecting Permit

1) Is the purpose adequate to justify removing the species (if the project requires this)?
   - Permits will be issued if the identified project is consistent with the goal of the Species Action Plan for the Southeastern American Kestrel (i.e., improvement in status that leads to removal from Florida's Endangered and Threatened Species List), or addresses an identified data gap important for the conservation of the species.
2) Are there direct or indirect effects of issuing the permit on the wild population?
   - Applicants must include detailed methods, including measures taken to minimize take. Applications also should include proposed study duration, sample size, and disposition of individuals, as appropriate.
   - Trapping, capturing and handling kestrels may impact the wild populations' ability to forage, breed, or rear young. Trapping and handling protocols must be included in the permit application and should identify measures to lessen stress for captured individuals and to lessen impacts to kestrel populations.
   - Methodologies for any collection of tissues such as blood should be clearly spelled out, including measures taken to reduce stress/injury to the birds.
3) Will the permit conflict with a program intended to enhance survival of species?
   - Applications must include clear objectives to ensure that the project does not conflict with other conservation efforts for the species.
   - Coordination with land managers and partners (county, city, state or national) should be addressed in the application to demonstrate that the project will not conflict with other efforts for the species.
   - Applications should identify where trapping or handling will occur (privately owned or public lands).
4) Will issuance of the permit reduce the likelihood of extinction?
   - Projects consistent with the goal of the Species Action Plan or that fill identified data gaps in species life history or management may reduce the likelihood of extinction.
   - Applications must include clear project objectives and justification of why the proposed research has a scientific or conservation purpose, including how the project advances conservation of the species.
5) Has the applicant sought the opinions or views of other scientists or other persons or organizations having expertise concerning the species?
6) Is applicant expertise sufficient?
   - Applicants must have prior documented experience with this or similar species, and applicants should have met all conditions of previously issued permits.
   - The application should describe the qualifications (e.g., experience or training) of all project participants and the resources and facilities available to conduct the proposed work.

Relevant to all Scientific Collecting Permits for the Southeastern American Kestrel

Permit amendment and renewal applications must be "stand alone" (i.e., include all relevant information on objectives and methods). Applications must include a proposal that addresses all considerations for issuing a scientific collecting permit.

As noted above, scientific collecting permit applications must include detailed qualifications or training for all individuals that will be capturing or handling kestrels. For those likely to submit multiple applications over time, the FWC strongly encourages applicants to upload qualifications as

part of an application for a self-issuing Registered Agent permit in FWC's online permitting system. The FWC also encourages applicants to include qualifications of sub-permittees in the Registered Agent permit.

Any mortality should be reported to the FWC, and specimens shall be properly disposed. A final report shall be provided to the FWC in the format specified in the permit conditions.

Additional information

Information on economic assessment of Species Conservation Measures and Permitting Guidelines can be found at http://myfwc.com/wildlifehabitats/imperiled/management-plans/

Contact

For permitting questions or to report mortalities, contact the FWC at (850) 921-5990 or WildlifePermits@myfwc.com. For more regional information and technical assistance, visit https://myfwc.com/license/wildlife/protected-wildlife-permits/contacts/

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Appendix A. Calculating the Habitat Use Centroid

The Habitat Use Centroid is the average position of observed kestrel locations recorded during three surveys. The Habitat Use Centroid is used to estimate the location of a kestrel territory and its associated Suitable Foraging Habitat, so one can determine if significant habitat modification will occur.

- Plot kestrel sightings from all surveys conducted. Kestrel sightings that are greater than 0.31 mi (0.50 km) away from each other are considered different territories. To determine if a group of sightings are part of one territory, buffer each sighting with an 820-ft (0.25-km) radius. Sightings where the 820-ft buffer intersect are considered a single territory and those locations should be taken together to determine the habitat use centroid.
- Locations can be included in the calculation more than once if kestrels were recorded at that location multiple times over the surveys.
- Calculate the average of the latitudes and the average of the longitudes of the kestrel locations to determine the coordinates of the habitat use centroid.
- Plot the habitat use centroid on the map of the project and draw a 0.31-mi radius around the habitat use centroid to determine the kestrel territory. Determine the total acreage of Suitable Foraging Habitat (see definitions) within 0.31-mi radius of the Habitat Use Centroid. Although land cover classification maps are helpful in determining suitable habitat, aerial imagery should also be used to confirm habitat such as sandhill and pine woodlands have the appropriate canopy cover. On an aerial image in suitable habitat, trees will be widely spaced enough that the observer should see the ground through the canopy.
- Overlay development plans to determine if take will occur:
    1. Inactive Nest Cavity removed by the project activities, or
    2. Project activities will come within 490 ft of an Active Nest Cavity, or
    3. Reduction of Suitable Foraging Habitat to less than 124 ac within a 0.31-mi radius around the Habitat Use Centroid, given available Suitable Foraging Habitat prior to development is 124 ac or more.
- When calculating the acreage that will remain post-development, include Suitable Foraging Habitat that is off-site as well as on-site within the 0.31-mi radius.

Appendix B. Kestrel Nest Box Placement and Monitoring

Kestrels readily use nest boxes placed in appropriate habitat. Nest boxes are recommended in areas where Suitable Foraging Habitat is present, but cavities are limited. Kestrels may take a year or two to locate and use boxes. Installation of nest boxes is only recommended if they can be maintained for at least three years.

Registering Kestrel Nest Boxes

Landowners and other entities interested installing and monitoring nest boxes may be eligible to participate in FWC's Registered Kestrel Nest Box Program. Nest boxes installed and monitored in coordination with FWC as part of this program are classified as Voluntary Conservation Kestrel Nest Boxes. To promote installation of Voluntary Kestrel Nest Boxes in appropriate areas, take via significant habitat modification is authorized within a 0.31-mi (0.50-km) radius of these nest boxes. If considering installation of kestrel nest boxes on your property, please note the following:

- Interested participants should contact Imperiled@myfwc.com for additional information on participating in this program.
- Registered nest boxes should adhere to the recommendations for nest box placement, monitoring, and maintenance guidelines outlined here.
- Monitoring data will be shared with the FWC.
- Registered box locations will be recorded and available on the FWC Kestrel Nest Box Locator Map (*https://geodata.myfwc.com/pages/upland*).
- Coordination and technical assistance are available to ensure kestrel nest boxes are placed in appropriate habitat.
- A minimum of a 3-year commitment to monitor Volunteer Conservation Kestrel Nest Boxes is requested, and longer-term monitoring is encouraged.

Nest Box Design

Kestrel nest boxes can be purchased or made and should have the following features:

- Untreated and unpainted wood (best options: cypress, cedar, or pine) at least ¾ of an inch thick.
- Entrance hole 3 in in diameter.
- A sloped roof and drainage holes in the floor to keep the interior dry.
- No perches outside of the box (these may help predators get into the box). An optional perch inside the box, however, may help chicks as they prepare to fledge.
- Ventilation near the roof of the box (e.g., a gap between the side walls and the roof or small holes drilled at the top of the side walls).
- A door, either on the side or on the roof, to allow for cleaning out boxes and adding wood chips.
- A 3-in doorsill to prevent chicks from falling out when the door is opened (optional but recommended if nest checks are done by opening the box).

Nest Box Maintenance

- Kestrels do not bring nest material into the nest box, therefore providing woodchips (2-3 in deep) on the bottom of the nest box is crucial. Do not use saw dust as a replacement, as chicks can inhale these small particles while consuming food. If you do not put nesting material in the box, kestrels will lay eggs on the bare floor that may be crushed or addled during incubation, resulting in nest failure. **Never install a kestrel nest box without woodchips**, unless it is a segment of a wooden utility pole with an existing woodpecker cavity. In cavities excavated by woodpeckers, the bottom is uneven and therefore the eggs are not on a flat surface.
- Nest boxes should be inspected annually prior to the breeding season (i.e., December – January) to replenish wood chips and to perform any necessary repairs.

- Other designs may also be suitable for southeastern American kestrels (for instance, PVC cylinder boxes on utility poles) as long as nest boxes have nesting material added and replenished, especially within the first three years of the nest box installation. After three to five years, nesting material layer is compacted and will continue to provide a suitable surface for eggs.

Nest Box Placement

Appropriate nest box placement will increase the likelihood of kestrels finding and utilizing the box.

- Place nest boxes in areas with at least 124 ac of Suitable Foraging Habitat within a 0.31-mi radius of the box.
- Mount nest box 10 to 15 ft above ground on a tree or wooden pole.
  - Please note: Installing kestrel boxes on utility poles requires permission from the utility company or private landowner.
- Nest boxes may be mounted to structures or trees with two 3-in screws on the top and bottom of the back of the box. Wire or zip ties can also be used to mount the box but are not recommended on live trees.
- Face kestrel nest boxes away from roads, trees, or other hazards, and ensure the flight path to the opening is unobstructed. If possible, also position opening in southerly or easterly facing direction. Note that facing the opening away from hazards and trees is more important than orientating in a direction.
- Place kestrel nest boxes in open grassy areas at least 164 ft (50 m) and ideally 490 ft (150 m) from dense woodland edges. Placing nest boxes away from woodland borders decreases the likelihood of squirrels and mice occupying boxes (Rohrbaugh and Yahner 1997).
- Maintain low and open vegetation in the area surrounding kestrel nest box (i.e., within 100 ft [30.5 m] of the nest box). Remove tall or encroaching vegetation (such as vines) on or near the mounted kestrel nest boxes, as vegetation allows predators to more easily climb to the nest box. To increase likelihood of box use, perform vegetation maintenance outside of the breeding season.
- If placing nest boxes near a road, use smaller, less trafficked roads (i.e., unsurfaced or rural roads, roads with wide shoulders, roads with lower speed limits).
- For sandhill and woodlands, avoid areas with a well-developed palmetto understory. Tree canopy closure should be 25% or less (see definitions for Suitable Foraging Habitat).
- When placing multiple nest boxes in an area, space them at least 0.50 mi [0.80 km] apart.
- If red imported fire ant mounds are present at the base of the support structure, consider applying a granular fire ant treatment product. Fire ants can have detrimental effects on nestlings leading to disfigurement and mortality.

Monitoring Kestrel Nest Boxes

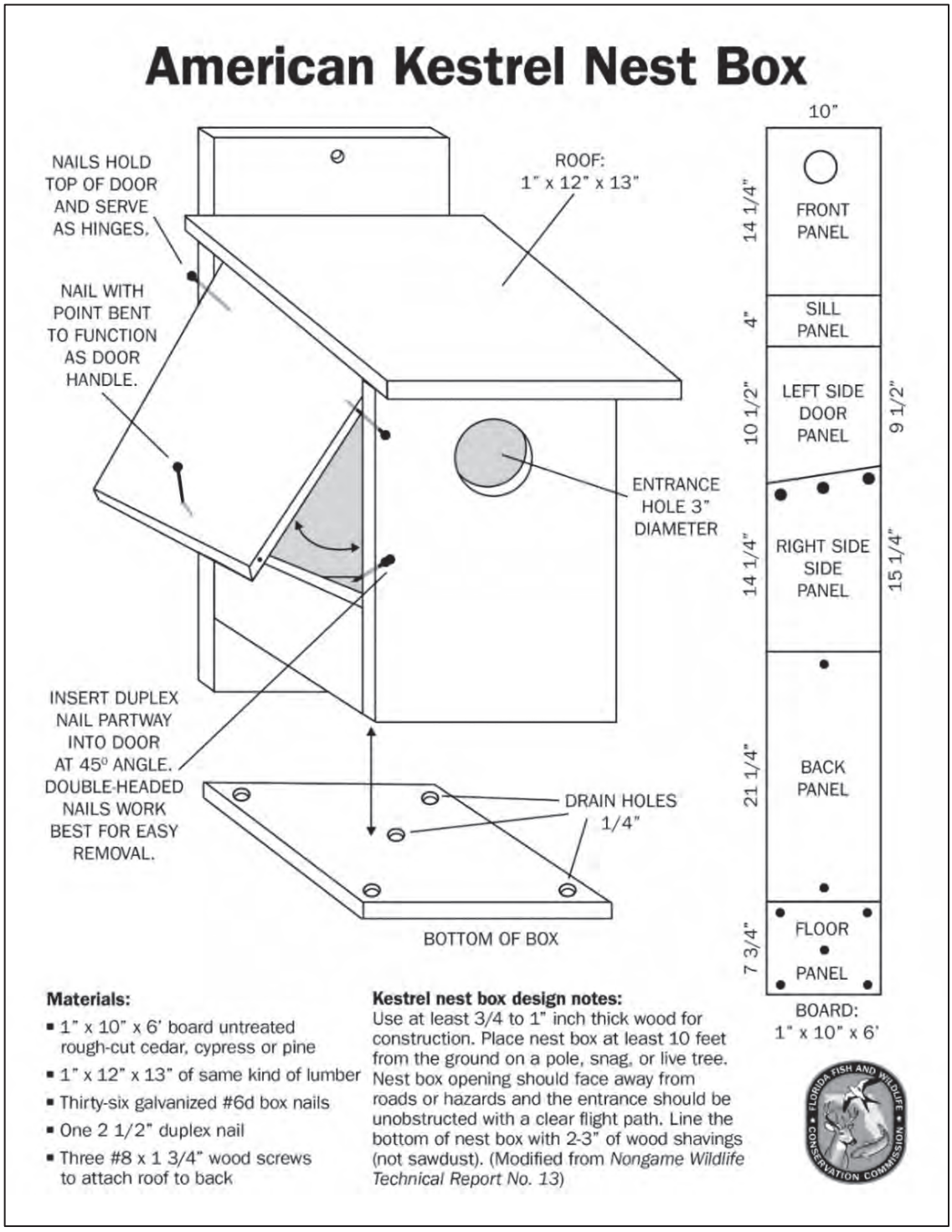
A permit is not needed if the following protocol is used when monitoring kestrel nest boxes. Adults, chicks, and eggs should not be touched or handled. For monitoring of kestrel nest boxes, FWC recommends the following protocol:

- Check nest boxes three times during the breeding season: first week of April, first week of May, and the first week of June. If kestrels nest a second time during the breeding season (e.g., the June nest check contains eggs), an optional fourth check in the first week of July may be needed.
- For Florida, three visits spaced one month apart during these timeframes provides enough information to determine kestrel use and whether the nesting attempt was successful with minimal disturbance to the breeding pair (Miller and Fasoli 2014). Nest box checks should be completed during daylight hours in the absence of strong wind and rain.
- Minimize disturbance during the nest check by approaching quietly. If opening a nest box to check

contents, do so in under five minutes.

- Do not check nest boxes if you can see the chicks peering out from the entrance. These chicks are close to fledging and could prematurely jump out of the nest if disturbed.
- Cameras are useful tools to check nest boxes with minimal disturbance, especially later in the season when chicks are larger. There are cameras made specifically for checking cavity nests (e.g., red-cockaded woodpecker nests). The camera should only be in the nest cavity for the time needed to check the contents. Do not stand near the nest box for more than 5 minutes.
    - If adult is in the cavity and contents of the nest cannot be seen, remove the camera. The adult may flush once the camera is no longer blocking the entrance, but if it does not, simply record that the adult would not flush.
- Record species occupying the nest box, number of eggs, and/or young.
- Record presence/absence of kestrel droppings (successful nests will have white droppings on the walls or appear “whitewashed”).
- Upload data to American Kestrel Partnership (https://kestrel.peregrinefund.org/) to contribute data for tracking trends of kestrels
    - Monitoring data are useful even if boxes are not used.
    - Follow protocol outlined here, not the American Kestrel Partnership protocol, as this protocol is specific to southeastern American kestrel timing.
- For boxes mounted on a hinged pole that can be pulled down to eye-level, do not pull down the box during the breeding season. The movement may jostle and addle eggs, and could increase likelihood of older young prematurely fledgling, even if a string is placed at the bottom of the box to stabilize the movement. Boxes should be brought down only during cleaning and maintenance.

Kestrel Nest Box Diagram



Appendix 1

Mitigation Proposal with Mitigation Map Set

SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT

MITIGATION PROPOSAL

DESOTO, HARDEE, AND MANATEE COUNTIES, FLORIDA

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MAPS

Southeastern American Kestrel Proposed Mitigation Map ..... Follows Text
Southeastern American Kestrel Programmatic Permit Map ..... Follows Text
Breeding Bird Atlas Map ..... Follows Text

1.0 INTRODUCTION

The southeastern American kestrel (*Falco sparverius paulus*) is the smallest falcon found in the United States and is a non-migratory subspecies of the kestrel (*Falco sparverius*). They have been listed as State Threatened due to the loss of nesting and foraging habitat. Southeastern American kestrels are secondary cavity nesters that depend on tree cavities excavated by woodpeckers or other natural tree cavities for nesting sites. Most natural nest cavities are in dead longleaf pine (*Pinus palustris*), sand pine (*Pinus clausa*), or various oak (*Quercus* spp.) trees. The southeastern American kestrel is closely associated with the southeastern sandhill ecosystem. The typical sandhill landscape consists of a widely spaced canopy of longleaf pine or slash pine (*Pinus elliottii*) with wiregrass (*Aristida stricta*) and forb dominated groundcover. This ecosystem provides both prey (e.g., insects) and nesting sites (e.g., tree cavities) for kestrels. Southeastern American kestrels also use a variety of other natural communities in Florida including scrub, scrubby flatwoods, and dry prairie. A full biological description of the species is well summarized by Florida Fish and Wildlife Commission (FWC) imperiled species guidelines (Species Conservation Measures and Permitting Guidelines for the Southeastern American Kestrel [December 2020]).

In addition, human-modified landscapes such as cattle pastures, parks, golf courses, and open fields are also used, but little to no information is available about kestrel survivorship and reproductive success in these human-modified habitats. Kestrel's also readily use artificial nest boxes, and when they are deployed in human-modified landscapes, they have proven to serve as successful breeding habitats that could increase reproductive success and subsequently population growth rates (Southeastern American Kestrel Species Action Plan [2013]).

Mosaic Fertilizer LLC (Mosaic) is a phosphate mining company with properties and holdings occurring within rural settings that constitute suitable habitat for southeastern American kestrel, including post mined reclaimed lands (i.e. human-modified landscapes). According to the Southeastern American Kestrel Species Action Plan (2013), no information is available about kestrel survivorship and reproductive success in many of these human-modified habitats. Due to the nature of the mining operations, it is not feasible to avoid affecting the southeastern American kestrel or significantly modifying habitat from the onset of mining operations until reclamation is completed. Therefore, Mosaic is requesting a Mine-wide Programmatic Permit for the incidental take of the southeastern American kestrel. This document summarizes Mosaic's proposed mitigation under the scientific benefit category, which identifies research and monitoring activities that provides scientific benefit in accordance Rule 68A-27.007, Florida Administrative Code (F.A.C.). The activities can include assessing the population status and reproductive health of kestrels in human-modified landscapes.

In alignment with suggested research activities that provide scientific benefit, Mosaic will undertake a five-year study to understand the occupancy and productivity of southeastern American kestrels utilizing nest boxes within human-modified (i.e., reclaimed habitats), and where appropriate produce peer-reviewed published literature that will benefit the conservation of the species.

2.0 BACKGROUND

The southeastern American kestrel requires large, connected areas of Suitable Foraging Habitat (SFH) to successfully breed and raise young. In accordance with the FWC's Species Conservation Measures and Permitting Guidelines for the Southeastern American Kestrel (December 2020), SFH is found in the following land covers classified according to the 2018 Florida Landcover Classification System (FLCS): High Pine and Scrub (Scrub 1210, Upland Coniferous 1230, Sandhill 1240), Mowed Grass (1810), Low Intensity Urban (Urban Open Pine 182112, Grass 18213), and Rural (Rural Open Pine 18312, Agriculture - Cropland/Pasture 18331). Within the land cover types above, SFH consists of either (1) open, low vegetation (≤10 inches) dominated by grasses or (2) low scrub oaks with interspersed sandy patches. In pine-dominated forests or sandhill communities, canopy cover in SFH is less than 40%, with 25% or less being optimal (i.e., on an aerial image, the ground is easily visible between trees). Understanding how the survivorship and productivity of southeastern American kestrels in human-modified habitats including reclaimed habitats can aid in future management and conservation plans for the species. Here we summarize what is known about nesting box occupancy part of our proposed mitigation plan.

2.1 Meta-Analysis of Expected Nest Box Occupancy Rate

Based on published literature, Table 1 below shows occupancy rates of nest boxes by southeastern American kestrels range from 14% to 78% and increased with the time since the boxes were installed (Wilmers 1982, Smallwood and Collopy 2009, Brown et al. 2014).

Table 1 Published Occupancy Rates of Kestrel Nest Boxes by Years Installed and Published Literature

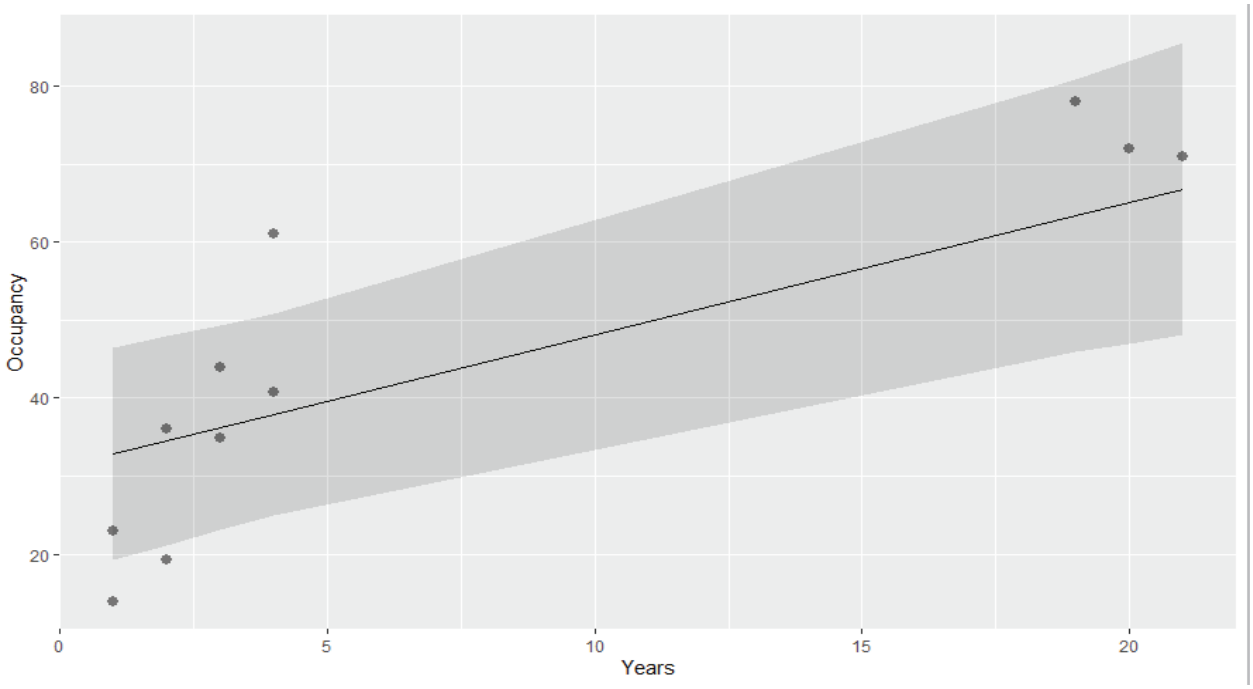
Years Installed	Percent Occupied by Kestrels	Year Published	Primary Author
1	14%	2009	Smallwood & Collopy
2	19%	2009	Smallwood & Collopy
3	35%	2009	Smallwood & Collopy
4	41%	2009	Smallwood & Collopy
1	23%	1982	Wilmers
2	36%	1982	Wilmers
3	44%	2014	Brown
4	61%	2014	Brown
19	78%	2014	Brown
20	72%	2014	Brown
21	71%	2014	Brown

To quantify this, a meta-analysis was conducted to investigate how nest box occupancy rates are constrained by years since installation. It was hypothesized that increasing years since installation would result in an increased occupancy rate. We also sought to determine what level of occupancy rates could be expected for Mosaic's proposed study. A linear mixed model (Package LMER, R Studio) was used to quantify the relationship between year since nest box installation and

occupancy rate, and also included the studies as a random effect to control for any spatiotemporal variation among study region and variation in methodology.

The model results support that increasing years since installation was positively related to occupancy rates (P-Value: 0.008, CI: 0.59-2.80, N:11), suggesting that the longer a nest box is present the greater the probability that a Kestrel will find and use it. In addition, from this modelled relationship it could be expected that approximately 36.24% (95 CI: 23.12%, 49.35%) of nest boxes installed in appropriate habitat will be occupied after three years and 63.36% (95 CI: 45.95%, 80.77%) occupied by 19 years (P-value 0.008). Please see Figure 1 showing predicted estimates of kestrel nest box occupancy rates by years since installation from the linear mixed model.

Figure 1 Predicted Estimates of Kestrel Nest Box Occupancy Rates by Years Since Installation from the Linear Mixed Model



Though this analysis did not control for habitat preferences and vegetation structure, the above summarizes past findings on this subject and opens the potential for future hypotheses to be tested. Appropriate habitat can often be difficult to determine. Wilmers 1982 (a West Virginia study) highlighted several key factors. The study found that only 15% of the nest boxes that bordered woods were used during the study, compared to 47% use of the boxes that were installed 50 meters from an edge. Based on this study result, Wilmers 1982 stated that the most important factor of use by kestrels was distance of a nest box from a forested border and recommended installing nest boxes at least 164 feet (50 meters) from a forested edge. Additionally, areas where nest boxes were used by kestrels had a lower percent of bare ground and deeper litter compared to those unused. Similarly in Miller 2019, percent of grass cover was the primary predictor for nest box occupancy.

Occupied patches averaged more grass cover (52%) versus unoccupied patches which averaged 32%.

3.0 PROPOSED STUDY

Mosaic will fund and undertake a five-year study to understand the occupancy and productivity of southeastern American kestrels utilizing erected re-used wooden utility poles fitted with nest boxes and "natural" nest cavities within human-modified post mined reclaimed habitats. Where appropriate, Mosaic will support the production of peer-reviewed published literature from collected data that will benefit the conservation of the species.

3.1 Hypotheses

We hypothesize that the reclamation landscape created post mining provides SFH for southeastern American kestrels and that the addition of erecting nest poles (with boxes and cavities) to these landscapes will allow kestrels to occupy and reproduce in these habitats. In addition, we hypothesize that successful occupancy rates will follow similar trends to what has been published. Furthermore, if reclamation landscapes become occupied and kestrels use nesting boxes, we will investigate how successful nesting attempts are and compare them to known literature.

3.2 Methods

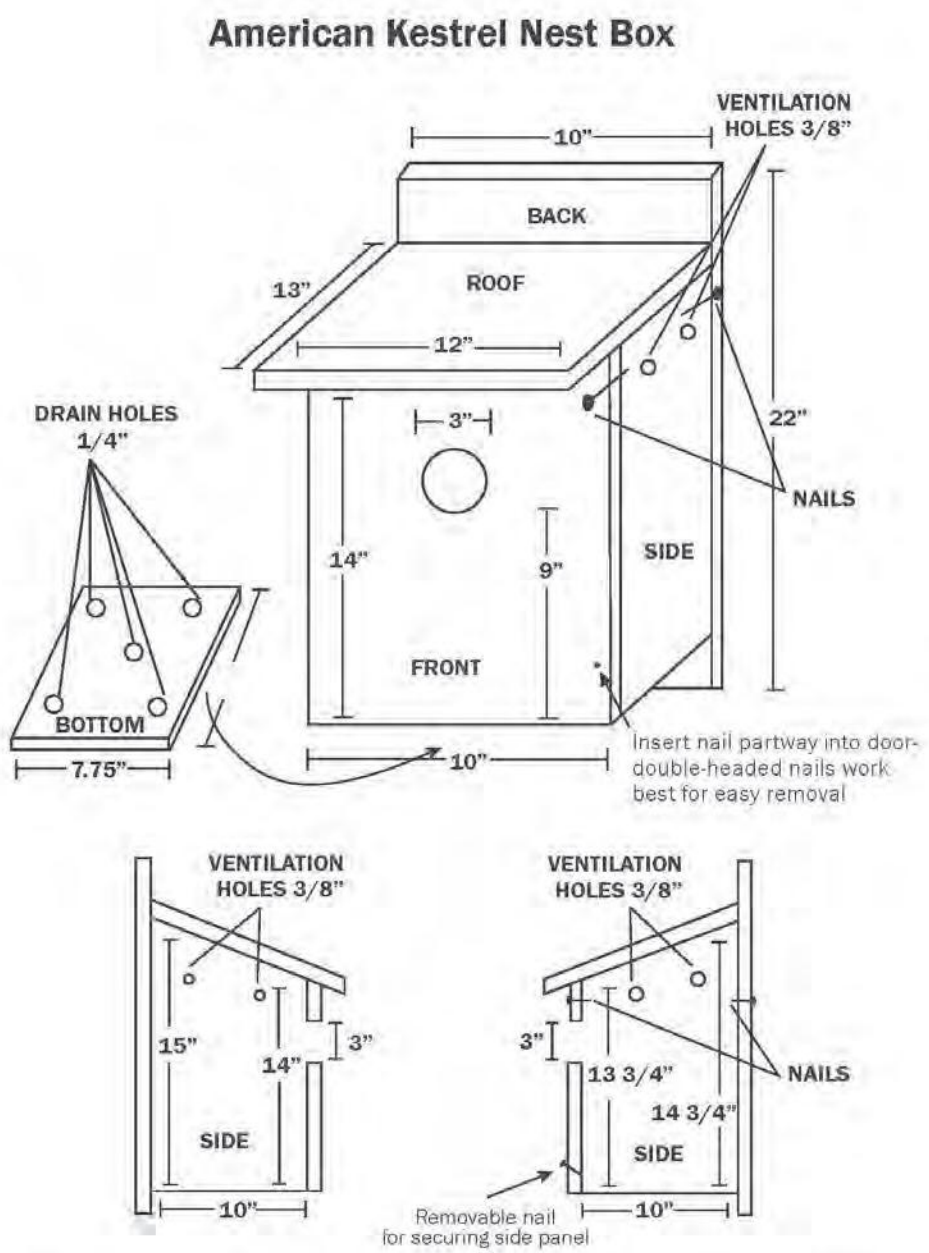
Mosaic will establish a total of 60 nesting sites using wooden utility poles placed within reclamation lands to mitigate for the incidental take via significant habitat modification (inclusive of inactive nest cavities) of up to 30 southeastern American kestrel pairs (two nest poles per pair). Please note that reclamation lands are subject to specific conditions dictated by state permits including construction standards, vegetative monitoring, and maintenance such as fire. Cattle may also be put back onto the reclaimed grassland habitats. Please refer to the Executive Summary of Supplemental Information Document for more details on the habitat management of reclamation areas.

The proposed mitigation includes the installation of 60 used utility poles with both nest boxes and cavities within the poles, each of which will be surrounded by at least 124 acres (7,440 acres total) of Suitable Foraging Habitat on existing reclaimed Mosaic lands, which is equivalent to a 2:1 ratio per impacted inactive nest cavity and associated kestrel territories. Representative locations of 50 of the nest poles are shown on Species Mitigation Maps 1-4 attached hereto. The actual location of all 60 nest boxes will be dependent on the available Suitable Foraging Habitat in the reclaimed landscape in which the nest boxes are installed. All 60 nest boxes/poles will be installed no later than two (2) years from the effective date of this Permit, at a rate of at least 30 nest boxes per year. Updated mitigation maps showing as-built locations will be submitted with each annual report provided pursuant to Part 5 of this report.

Each pole will be a re-used utility pole at least 20 feet above ground height. Each pole will also provide two nesting opportunities for kestrels, a "natural" cavity within the pole structure itself, as well as a kestrel nest box. Nest boxes will be consistent with Figure 2. If the re-used pole doesn't contain an appropriate natural cavity, an artificial cavity will be created by excavating similar to

those for red-cockaded woodpeckers (*Picoides borealis*) as found in Section 3B of the Cavity Management of the Second Revision of the Recovery Plan for the Red-cockaded Woodpecker (2003).

Figure 2 FWC Kestrel Nest Box Design



Kestel nest box design notes. Two nails at the top of one side panel act as hinges to swing the side open for cleaning. Use at least 3/4 inch thick wood for construction. Place nest box at least 15 feet from the ground on a pole, snag, or live tree in proximity to a roost tree. Nest box opening should face a southerly to easterly direction and the entrance should be unobstructed with a clear flight path. (Modified from Nongame Wildlife Technical Report No. 13)

Nest poles will be established within logical land reclamation units (LRUs) determined by available SFH for the southeastern American kestrel. LRUs will contain a minimum of 124 acres of SFH within a 0.31-mile buffer per nest pole. For example, within an LRU with 2,000 acres of SFH, a maximum of 16 nest boxes could be established. In such an LRU, sixteen poles would be preferred; however, based upon visual assessment of site specifics on actual reclaimed conditions and habitat arrangement, there may need to be a reduction for any specific LRU area.

These four general parameters for nest pole installation will be followed:

1. Spaced at least 2,640 feet (0.5-miles) apart in SFH
2. Natural cavity and kestrel box to be 10-20 feet (15 feet projected) above ground
3. Spaced at least 164 feet (50 meters) from forested habitats
4. 0.31-acre centroids located within 124 acres of maintained SFH

Utilizing Mosaic's maintained Geographic Information System (GIS) spatially explicit information, specifically LRUs and post-reclamation land uses (habitat), the proposed location of nest poles has been depicted in the Southeastern American Kestrel Proposed Mitigation Map. Nest pole locations are located within the same region of the currently known population based on publicly available and Mosaic collected data such as the FWC's Kestrel Nest Box Mapping Tool, Breeding Bird Atlas, eBird, and Mosaic-observed Southeastern American kestrel territories. In addition, the nest poles will be installed within the known range of the species and within 1-5 miles of known breeding based on Mosaic's observations of territories (Southeastern American Kestrel Programmatic Permit Map and Breeding Bird Atlas Map).

If this study is approved as proposed, locations will be finalized, and nest poles will be installed in year within 2 years of permit issuance and nest pole locations registered with FWC. Monitoring is anticipated to begin in the 2025 breeding season and continue annually for five years. Monitoring of each nest box will commence in the breeding season following installation of each pole and shall not be delayed until all 60 nest boxes are installed. Each nest box/pole will be monitored for at least 5 years regardless of date of installation. Annual monitoring and maintenance of the installed nest boxes will include:

- Annual maintenance performed in January
    - Includes clean out and fresh installation of wood chips/bedding material
- Annual monitoring to occur over three monitoring events
    - First week of April, May, and June
    - Record nest box condition
    - Determine occupancy
        - 30-minute monitoring event from 50 meters
        - Pole scope with camera when necessary
    - Note general productivity information
        - Bringing food to the nest, fledglings observed

- If perceived incubation, wireless cavity inspection camera (pole scope) to determine productivity

Monitoring protocol is based on Miller and Brown 2022. All artificial nest boxes and cavities will be visited, cleaned, and filled with wood chips in January to ensure condition are consistent among sites and to avoid potential biases of nest box/cavity conditions. Monitoring events will begin in April and continue into June and will be performed the first week of each month. Each nest box and cavity will be checked a maximum of three times to limit human disturbance at the site. Nest box sites or cavities will be deemed occupied when a direct observation of a kestrel is observed at or in the box or cavity, with a specific distinction on whether it was the box or cavity. The frequency of the monitoring events is supported by a recent study presented by Miller and Brown at the 2022 Raptor Research Foundation Conference in which three events conducted over the breeding season was deemed sufficient to determine 100% occupancy of a nest box.

Observation methods will include a qualified observer watching from 50 meters away for 30 minutes. If no direct observation occurs within 30 minutes, a wireless cavity inspection camera will be inserted into both the artificial box and artificial cavity structure to determine any unobserved occupancy. Monitoring events will continue as previously mentioned until nest initiation, and the nest site is determined (i.e., box or cavity).

To allow for the interpretation of reproductive success, observers will note activities such as food brought to the nest or if fledglings are observed. During perceived incubation, a wireless cavity inspection camera will be used to determine average clutch size, hatch success, and fledgling success.

3.3 Expected Analyses

Human-modified (reclaimed) landscape nest box/cavity use and accumulated use over five years will be compared to known literature on nest box/cavity use, using occupancy rates of the 50 nest poles over time. The expected outcome will be an increasing level of nest box/cavity use for each additional year of the study. We will also compare in a choice framework if a “natural” like cavity has an increased probability of use compared to a nest box. In addition, individual characteristics of nest pole location and use will be collected, to assess if they impact probability of use. For example, these covariates could include nearest known southeastern American kestrel breeding activity, occupancy by other species, area of grass cover compared to other vegetation, average tree density, proportion of wetland in buffer, time since reclamation, and others. Based on sample size it will only be possible to address two of these covariates in the same model, but through a step wise procedure of comparing one against another we will be able to determine covariates of highest influence on southeastern American Kestrel occupancy.

Reproductive success measured as fledged young will be recorded when possible and compared across the duration of the study.

4.0 HABITAT MANAGEMENT

In association with mitigation erected Southeastern American Kestrel Nesting Boxes and Cavities each utility pole area includes site management activities to sustain and provide forageable habitat to support

a pair of breeding SE American Kestrels. Management activities will be conducted for a minimum of 5 years when needed.

4.1 Management Activities

Management activities can include a combination of prescribed fire, mechanical mowing treatment, selective hand clearing, invasive species management, additional plantings, and use for cattle grazing. The sites will be managed to keep herbaceous structure, especially during the breeding season, open and low.

4.2 Prescribed Fire

Prescribed fire will be one of the primary land management tools. The target frequency of prescribed fire will be every 2-3 years, in order to keep the vegetation in optimal condition unless demonstrated it is unnecessary. Burns will be conducted during years when there has been adequate rainfall, and when wind directions and other environmental factors will allow for the best weather conditions for an ecologically sensitive growing season fire.

If the condition of the habitat warrants a longer fire return interval it will be implemented, and conversely, if the site appears overgrown with vegetation detrimental to SE American Kestrel foraging needs, the site will be burned on a shortened fire return interval. Prescribed fire will be done in a rotational fashion using the natural land contours and/or vegetation breaks to dictate specific burn units, with the goal to leave between 10% to 30% of the habitat per burn cycle unburned. Due to the site's relative young age, burns are often patchy in nature leaving patches of habitat unburnt.

4.3 Invasive Plant and Animal Management

As part of reclamation activities, all invasive exotic species will be managed and treated to ensure adequate coverage of a diversity of desirable native or pastoral species with the goal to remove or eliminate invasive species. Invasive exotic species are required to be kept to less than 5% for reclamation activities. Herbicide treatments will be applied by a licensed applicator. In addition, trapping and other measures may be used to control nuisance and exotic animal species, e.g., feral hog (Sus scrofa).

4.4 Pole and Nest Box design

A used weathered utility pole of 15-25ft will be erected within suitable foraging habitat of a minimum of 124acre with 0.31mile of the nest box. These habitats are typically herbaceous grass dominated short stature habitats, with low density canopy of trees.

4.5 Compatibility of Proposed Land Uses

All current land uses within the landscape of where nesting boxes are erected are compatible with the goal of establishing and maintaining a breeding pair of SE American Kestrels. Management techniques such as prescribed burning, canopy tree thinning and/or herbiciding

invasive plant species will promote suitable foraging habitat. Cattle grazing which may occur on some pasture sites is also compatible.

Mosaic implements cattle management plans that ensure activities are consistent with the sustainable native land management practices established by the State of Florida utilizing applicable best management practices (BMP) which intend to minimize adverse impacts to native habitats. Acceptable BMP may include, but are not limited to, those established by the Florida Department of Agriculture and Consumer Services (FDACS – Water Quality Best Management Practices for Florida Cow/Calf Operations, 2008 Edition). Cattle grazing densities shall accommodate the goal of maintaining the desirable levels of diverse native groundcover vegetation and height for Kestrels. Based on recommendations of the FDACS Water Quality Best Management Practices for Florida Cow/Calf Operations (2008 Edition – aka 2008 Cow/Calf BMP) stocking rates will be maintained at or below the forage availability levels.

5.0 REPORTING

Annual reports will be provided by October 30th of each year to FWC, and will be cumulative, providing results across all years of the study as it continues over time. The reporting will include descriptions of each utility pole mitigation site, the management activities undertaken in the site area, and all research data and summaries for each year of study.

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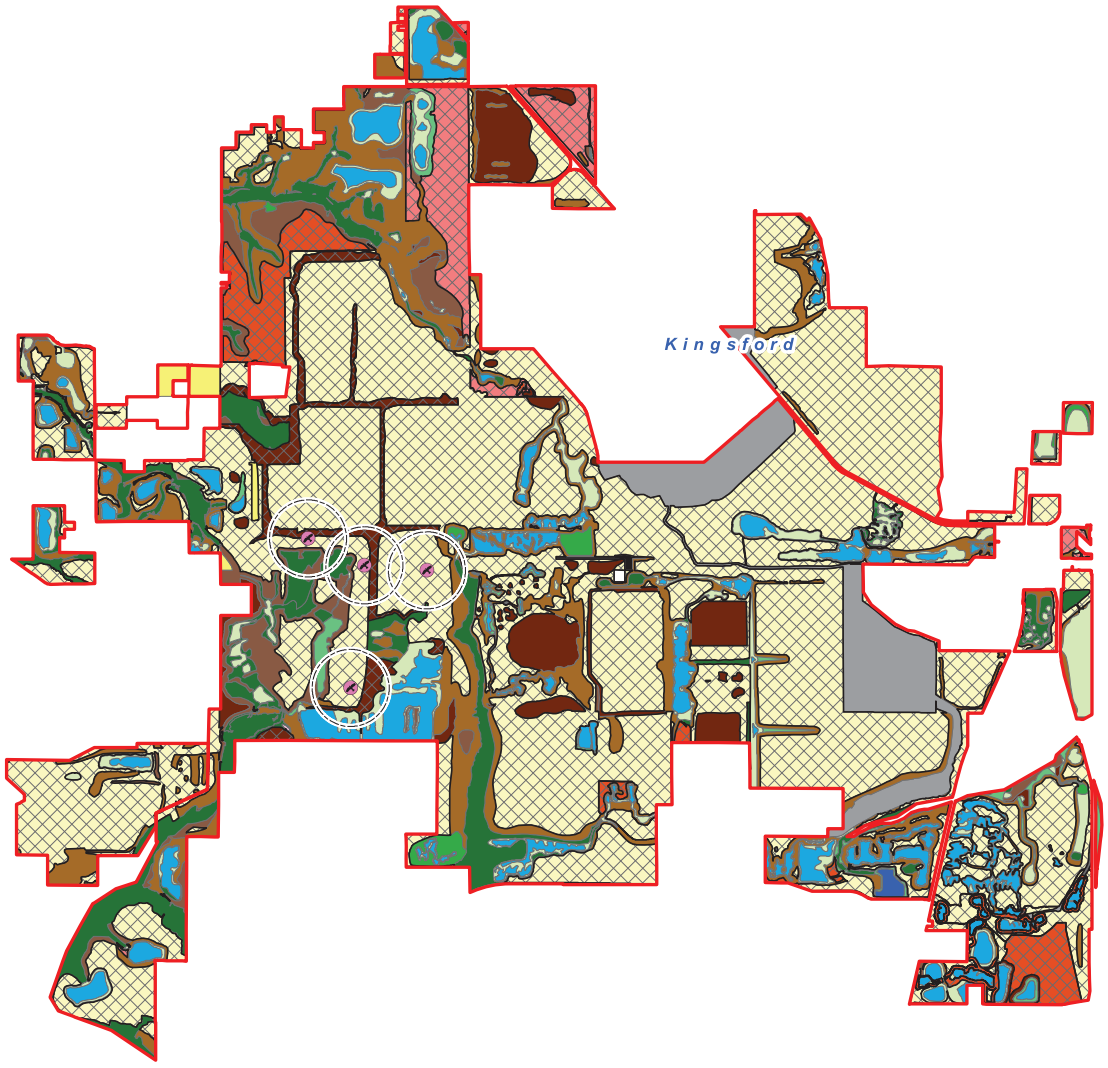
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Note: Updated map will be forthcoming with as-builts showing all mitigation nest pole locations

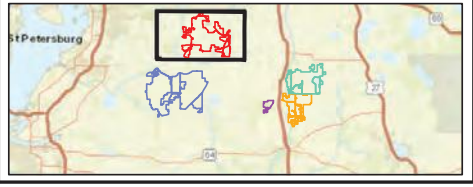
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MINE-WIDE FLORIDA SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT MOSAIC FERTLIZER LLC.

HILLSBOROUGH, POLK, MANATEE, HARDEE COUNTIES, FLORIDA

- Proposed Nest Pole Locations (50)
- Proposed Suitable Habitat Centroids
- Four Corners
- Kingsford
- South Ft. Meade - Hardee
- South Ft. Meade - Polk
- Fort Meade Hardee
- Suitable Foraging Habitat - 46,820.4 ac.



SOUTHEASTERN AMERICAN KESTREL PROPOSED MITIGATION MAP

FLATWOODS Consulting Group

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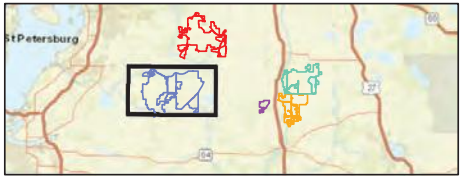
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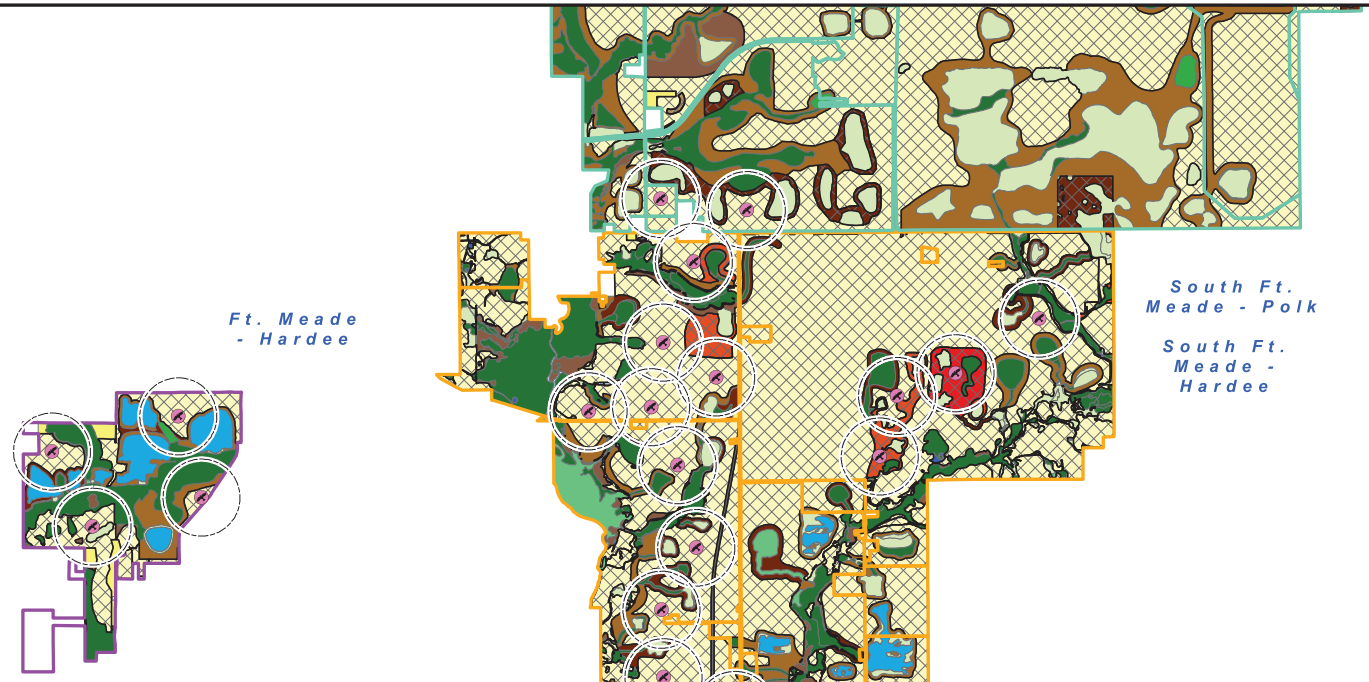
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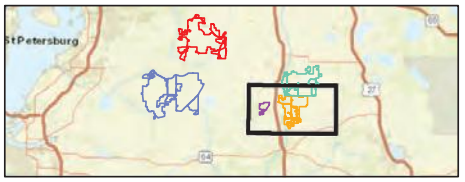
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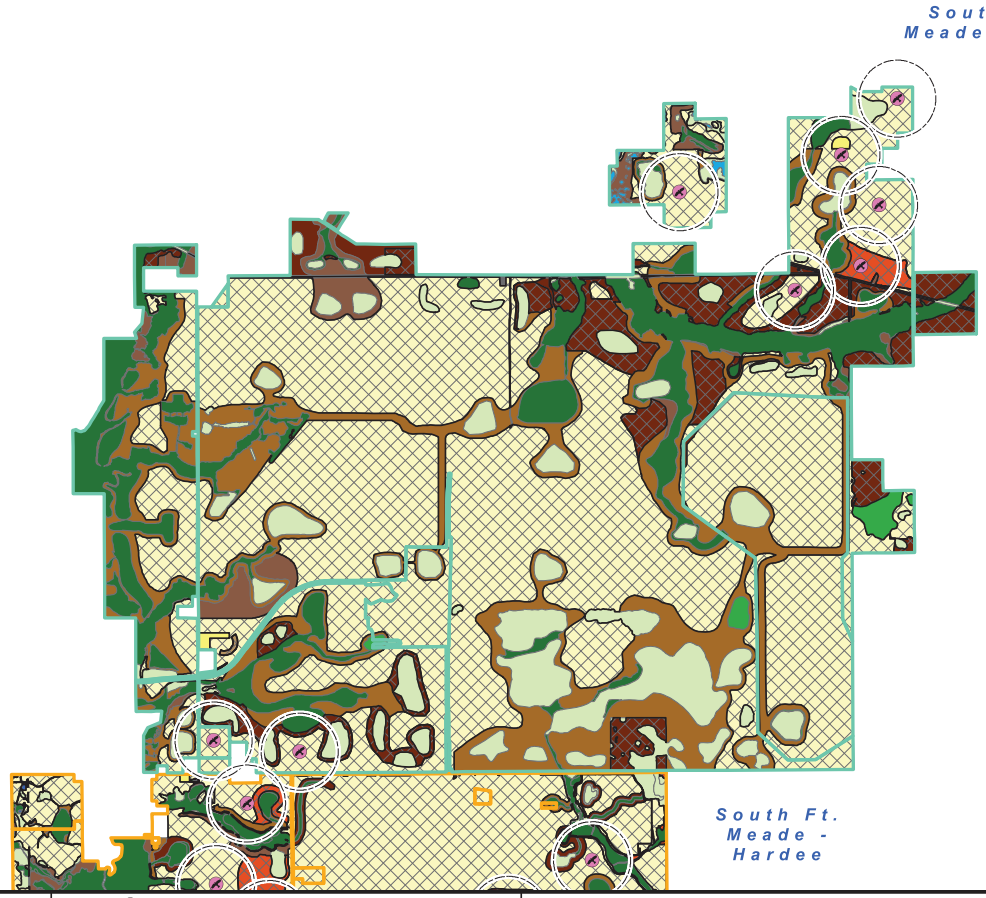
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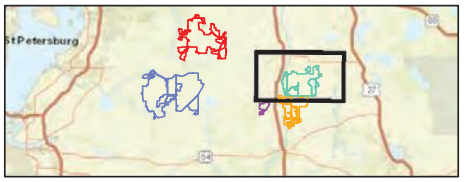
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FLATWOODS Consulting Group

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Appendix 2

Mitigation Ledger

Programmatic Southeastern American Kestrel Permit for Mosaic Fertilizer, LLC
PSLIT-24-001 Permit Ledger

Activity	Date	Permit Number	Ledger Modification Date	Nest Boxes/Poles Installed	Foraging Habitat (SFH) Added	Financial Contribution	SFH Reclaimed	Kestrel Pair Take by Harassment	Inactive Nest Cavity Removal	SFH Removed	Kestrel Pair/Inactive Balance	Suitable Foraging Habitat Balance

Appendix 3

Kestrel Take Methodology and Kestrel Survey Reports

MOSAIC FERTILIZER, LLC

SOUTH FORT MEADE – EASTERN EXTENSION
HARDEE COUNTY, FLORIDA

KESTREL SURVEY REPORT

Prepared for:

Mosaic Fertilizer, LLC
13830 Circa Crossing Drive
Lithia, FL 33547

Prepared by:

8306 Laurel Fair Circle•Suite 120
Tampa, FL 33610•813-600-5747

June 2022

Jessica I. Sirois
Ecologist I

Carrie E. Kelly
Sr. Ecologist/Vice President

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1.0 INTRODUCTION

Flatwoods Consulting Group Inc. (Flatwoods) was retained by Mosaic Fertilizer, LLC (Mosaic) to conduct a southeastern American kestrel (*Falco sparverius paulus*) survey for the South Fort Meade – Eastern Extension (SFM-EE) Project. The project is located in rural Hardee County and, in parts, is contiguous to Mosaic's SFM – Hardee County and SFM – Eastern Reserves Mines. The project includes an access/utility corridor that runs predominantly east to west south of County Line Road, a dragline walkpath that extends north from the existing SFM – Eastern Reserves along Maude Road to County Line Road, and the mine parcel, which is bounded by Mel Smith Road to the north and east, Old Town Creek Road to the west, and State Road 64 to the south (Location Map).

The southeastern American kestrel is a resident subspecies of the American kestrel (*Falco sparverius*) and is listed as Threatened by the Florida Fish and Wildlife Conservation Commission (FWC) under Chapter 68A-27, Florida Administrative Code (F.A.C.). Kestrels observed in Florida during the breeding season (April-August) are assumed to be resident southeastern American kestrels. They are found in upland habitats, including sandhills, flatwoods, pastures, sand pine scrub, and prairies. As cavity nesters and sit and wait predators, they require suitable cavity trees and perches in their territories as well as open ground cover to see and capture their prey. Typical prey items include insects, lizards, small rodents, and small birds. The purpose of this species-specific survey was to identify the presence or absence of the resident Southeastern American kestrel on the project site. During general listed species surveys, kestrels were observed within the project site. In addition, there is a Duke Energy Transmission Line that runs across portions of the mine site that contain kestrel nest boxes which have been observed being used during previous site visits. During the kestrel surveys these nest boxes were recorded separately from cavities.

2.0 SOUTHEASTERN AMERICAN KESTREL SURVEY METHODOLOGY

The southeastern American kestrel survey was conducted in accordance with the survey methodology within the FWC's Species Conservation Measures and Permitting Guidelines for the Southeastern American Kestrel (December 2020), hereafter referred to as Guidelines. Three surveys, with at least four to seven days between each, were performed during the April 1 - August 31 survey season as required. Each survey was performed by multiple Flatwoods ecologists to ensure coverage of the entire project area.

Pedestrian and vehicular surveys were conducted in all preferred kestrel nesting habitats starting at sunrise and continuing to three to four hours past sunrise on calm, clear days. Ecologists noted and mapped observations of all individuals, as well as suitable cavities, active nest cavities, and inactive nest cavities. Suitable cavities are defined as hollow spaces approximately three inches in diameter and located 10 feet from the ground within a tree or man-made structure that can support breeding and sheltering by kestrels during or outside of the breeding season. An active nest cavity is defined as a suitable cavity that supports breeding (i.e., egg laying, incubation, rearing of dependent chicks) and can be determined if one or both kestrels are seen occupying the cavity. All suitable cavities were monitored for kestrel activity during these surveys. Inactive nest cavities could not be determined during the time of the surveys but are defined as inactive once young have fledged, or an active nest cavity is considered inactive once the breeding season is over. Kestrels will re-use inactive nest cavities in subsequent breeding seasons and use them outside of the breeding season for sheltering.

Weather conditions including temperature, wind speed and direction, precipitation, and visibility were recorded for each survey. All kestrel observation points and cavities were recorded with a sub-meter Global Positioning System (GPS) and depicted on an aerial image.

Following the surveys, Flatwoods plotted the kestrel sightings from all surveys conducted. The Habitat Use Centroid is the center point of documented kestrel foraging use/the average position of observed kestrel locations recorded from surveys. The Habitat Use Centroid is used to estimate the location of the kestrel territory(ies) onsite and its associated Suitable Foraging Habitat (SFH) to determine if significant habitat modification will occur as a result of the project. Further detail regarding the Habitat Use Centroid is provided in Section 4. The definition of SFH per the Guidelines uses the following habitats from the Florida Cooperative Land Cover (CLC) Map which uses the Florida Land Cover Classification System (FLCCS): Scrub (FLCCS 1210), Upland Coniferous (FLCCS 1230), Sandhill (FLCCS 1240), Mowed Grass (FLCCS 1810), Urban Open Pine (FLCCS 182112), Grass (FLCCS 18213), Rural Open Pine (FLCCS 18312), and Agriculture-Cropland/Pasture (FLCCS 18331). In addition to the habitats listed, the canopy cover in forested habitats (i.e., Upland Coniferous, Sandhill, Urban Open Pine) must be less than 40 percent to be considered suitable.

3.0 PROJECT AREA DESCRIPTION

Site-specific land cover was determined via extensive field review including the delineated wetland lines pursuant to Chapter 62-340, F.A.C. for wetlands and other surface waters. Land uses are classified using the 1999 Florida Department of Transportation (FDOT) Florida Land Use, Cover and Forms Classification System (FLUCFCS) as depicted on the Existing Land Use Map. Environmental Resource Permitting (ERP) efforts require the use of FLUCFCS, while SFH for the southeastern American kestrel is determined using FLCCS. Therefore, a crosswalk table from FLUCFCS to FLCCS is provided in Section 3.2.

3.1 Upland and Wetland Community Descriptions

The existing upland and wetland communities are detailed below and were determined using a combination of the publicly available Southwest Florida Water Management District (SWFWMD) FLUCFCS data and site-specific mapping based on current conditions. The site-specific vegetative communities within the project area were classified in accordance with the 1999 FDOT FLUCFCS as discussed above.

Upland Land Use Communities

Fixed Single Family Units (FLUCFCS 111) includes the residences that are located within the project area and occur predominantly along Old Town Creek Road. These residences typically consist of a house, associated landscaping and lawn, and barns or storage sheds.

Improved Pasture (FLUCFCS 211) is comprised of land which has been cleared and seeded with grasses such as bahiagrass (*Paspalum notatum*) and/or bermudagrass (*Cynodon dactylon*). Improved pastures are generally maintained by active livestock grazing, mowing, and fertilizing. Other groundcover species typical of pastures include crabgrass (*Digitaria ciliaris*), dogfennel (*Eupatorium capillifolium*), horseweed (*Conyza canadensis*), and thistles (*Cirsium* spp.).

Woodland Pasture (FLUCFCS 213) is comprised of forest lands used as pastures. Generally, oaks or pines dominate with limited to no native shrub and/or groundcover. Groundcover typically includes pasture grasses or may be bare soil due to trampling and/or grazing pressures. Typically, there is also little to no regeneration of the canopy species. Canopy species generally include live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), and slash pine (*Pinus elliottii*). Commonly found shrub species include saw palmetto (*Serenoa repens*), lantana (*Lantana camera*), beautyberry (*Calicarpa americana*), and paw-paw (*Asimina* spp.). Ground cover is predominantly bahiagrass, along with yellow jessamine (*Gelsemium sempervirens*), tropical soda apple (*Solanum viarum*), sour paspalum (*Paspalum conjugatum*), carpetgrass (*Axonpus* spp.), broomsedges (*Andropogon* spp.), cogongrass (*Imperata cylindrica*), caesarweed (*Urena lobata*), common dayflower (*Commelina diffusa*), llima (*Sida cordifolia*), greenbrier (*Smilax* spp.), and grapevine (*Vitis rotundifolia*).

Field Crops (FLUCFCS 215) consists of fields that are predominantly limpograss (*Hemarthria altissima*) or African burmudagrass (*Cynodon nlemfuensis*) grown for hay.

Tree Crop and Citrus Grove (FLUCFCS 220 and 221) includes both active and inactive citrus groves. Cultivated orange and lemon are the primary tree species. Land management activities (mowing and herbicide application) minimize colonization of other plant species in all strata. Despite these land management efforts, some ruderal species persist.

Specialty Farms (FLUCFCS 250) include a small area that appears to consist of dog kennels and horse paddocks that is predominantly vegetated with bahiagrass.

Dairies (FLUCFCS 252) consist of land which is used for dairy cow operations. These areas include dairy cow housing facilities such as barns and stalls for milking; however, the majority of land has been cleared and seeded with grasses such as bahiagrass and bermudagrass for grazing. Some of these areas also contain limpograss or African bermudagrass grown for hay or are harvested for sod.

Other Open Land (FLUCFCS 260) consists of fields that appear to have historically been used for agricultural row crops or cattle pasture and currently are overgrown with ruderal shrubs and herbs. The dominant groundcover includes bahiagrass with additional groundcover of dogfennel, blackberry (*Rubus* spp.), thistle, and common wireweed.

Shrub and Brushland (FLUCFCS 320) includes areas dominated by scrubby shrub species with little canopy coverage. Shrubs include scrub oaks (*Quercus* spp.), saw palmetto, wax myrtle (*Morella cerifera*), saltbush (*Baccharis* spp.) and lantana. Various types of herbs and grasses including cogongrass, broomsedges, bahiagrass, smutgrass, dogfennel, slender flattop goldenrod (*Euthamia caroliniana*), and blackberry also occur frequently.

Pine Flatwoods (FLUCFCS 411) generally occur either in relatively intact large tracts of land or are remnants or fragments of once larger communities now cleared for pasture or were previously timbered. Slash pine dominates the canopy with saw palmetto dominant in the shrub layer. Other shrubby understory includes gallberry (*Ilex glabra*) and wax myrtle. There are few herbaceous species typically consisting of shiny blueberry (*Vaccinium myrsinites*), wiregrass (*Aristida* sp.), blackberry, greenbriar (*Smilax* spp.), and grapevine.

Live Oak (FLUCFCS 427) is an upland forested land cover is dominated by live oak and contains little to no shrub or herbaceous cover due to the canopy cover. The areas within SFM-EE contain saw palmetto in the shrub layer.

Hardwood Conifer Mixed (FLUCFCS 434) are forests that contain both pines and hardwoods with neither category achieves 66 percent cover. The conifers may include slash pine or longleaf pine (*Pinus palustris*), while the hardwoods are most frequently live oak or laurel oak. Additional hardwood species that may occur include cabbage palm (*Sabal palmetto*) and sweetgum (*Liquidambar styraciflua*). The shrub layer is typically composed of saw palmetto, wax myrtle, beautyberry, and sparkleberry (*Vaccinium arboreum*). The groundcover is typically sparse due to the dense canopy cover but may include witchgrasses (*Dichanthelium* spp.), carpetgrasses, and caesarweed. Vines are common in this land cover and include greenbrier, grapevine, and poison ivy (*Toxicodendron radicans*).

Coniferous Plantation (FLUCFCS 441) includes a small area of planted slash pines within a surrounding pasture area.

Spoil Areas (FLUCFCS 743) includes spoil piles associated with excavation of the uplands. The vegetation typically includes ruderal grasses and forbs.

Roads and Trails (FLUCFCS 814) consists of paved and/or graded roads and areas maintained in conjunction with these roads.

Wetland Land Use Communities

Wetland and Upland Cut Ditches (FLUCFCS 513 and 514) consists of linear artificial channels dug through wetlands or uplands, respectively. Within the project area, these ditches typically contain soft rush (*Juncus effusus*), dotted smartweed (*Persicaria* spp.), pennywort (*Hydrocotyle* spp.), and Peruvian primrosewillow (*Ludwigia peruviana*).

Reservoir less than 10 acres [Cattle Ponds] (FLUCFCS 534 UP and 534 WET) corresponds to cattle or irrigation ponds excavated within either uplands or wetlands, respectively. They typically have steep banks and associated spoil (fill) piles. Although some vegetation may be present, they are typically open water. Vegetation may include spatterdock (*Nuphar advena*), little duckweed (*Lemna obscura*), common duckweed (*Spirodela polyrhiza*), and pennywort.

Cattle Waste Ponds (FLUCFCS 535 UP and 535 WET) corresponds to ponds excavated within either uplands or wetlands, respectively, within dairy operations. Some of these ponds are used for dairy waste and are permitted as such. They typically have steep banks and associated spoil (fill) piles. Although some vegetation may be present, they are typically open water.

Bay Swamps (FLUCFCS 611) is forested wetlands dominated by sweetbay (*Magnolia virginiana*), swamp bay (*Persea palustris*), and/or loblolly bay (*Gordonia lasianthus*). Other canopy constituents often include red maple (*Acer rubrum*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*).

Stream and Lake Swamps (FLUCFCS 615) refer to bottomland communities that provide a floodplain area of associated streams and/or ditched streams. These forested habitats contain a variety of hardwood tree species. Typically, the canopy is dominated by oaks including water oak (*Quercus nigra*), laurel oak, and live oak, but also contains an ill-defined mixture of sweetbay, swamp tupelo, swamp bay, American elm (*Ulmus americana*), red maple, dahoon holly (*Ilex cassine*) and sweetgum (*Liquidambar styraciflua)*. Shrubs include wax myrtle, buttonbush (*Cephalanthus occidentalis*), Virginia sweetspire (*Itea virginica*), swamp dogwood (*Cornus foemina*), and possumhaw (*Viburnum nudum*). Ground cover often includes Sphagnum mosses, lizard's tail (*Saururus cernuus*), swamp fern (*Blechnum serrulatum*), Virginia chain fern (*Woodwardia virginica*), netted chain fern (*Woodwardia areolata*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), and caeserweed (*Urena lobata*).

Mixed Wetland Hardwood (FLUCFCS 617) contain a variety of hardwood tree species. The canopy and subcanopy stratum included red maple, dahoon holly, sweetbay, swamp tupelo, cabbage palm, water oak, and laurel oak. Shrubs included saltbush, wax myrtle, and saw palmetto. Herbaceous cover included soft rush, lizard's tail (*Saururus cernuus*), redtop panicum (*Coleataenia rigidula*), iris (*Iris virginica*), maidencane (*Panicum hemitomon*), pennywort, smartweed, Virginia chain fern (*Woodwardia virginica*), common dayflower, and caeserweed.

Wetland Hardwood-Conifer Mixed (FLUCFCS 630) includes all areas where neither pines nor hardwoods attain a 66 percent majority of the cover. The understory plant community is similar to Mixed Wetland Hardwoods (FLUCFCS 617).

Freshwater Marsh (FLUCFCS 641) is a non-forested wetland land use type and is characterized by a variety of herbaceous species including soft rush, maidencane, pickerelweed (*Pontederia cordata*), common arrowhead (*Sagittaria latifolia*), Virginia chain fern, smartweed, spikerush (*Eleocharis* spp.), and water hyssop (*Bacopa caroliniana*).

Wet Prairie (FLUCFCS 643) is a shallow herbaceous dominated non-forested wetland typically dominated by grasses and sedges including pipeworts (*Eriocaulon* spp.), beaksedge (*Rhynchospora* spp.), yellow-eyed grass (*Xyris* spp.), broomgrass, and bluestem (*Schizachryrium* spp.).

Shrub Marsh (FLUCFCS 647) is dominated by an ill-defined mix of shrub species including wax myrtle, groundsel tree, elderberry (*Sambucus nigra*), Carolina willow (*Salix caroliniana*), gallberry, and Peruvian primrosewillow. Herbaceous species may include chain ferns, soft rush, and flatsedges (*Cyperus* spp.).

Wet Pasture (FLUCFCS 648) are areas converted to pasture which no longer have natural topography and few, if any, native species that indicates prior wetland type. These community types have been heavily impacted by agricultural activities. Vegetative cover can be significantly affected by grazing pressure and pasture maintenance, and species composition can vary from year to year.

3.2 Suitable Kestrel Foraging Habitat

Table 1, below, provides a crosswalk between the site specific FLUCFCS and the FLCC used to determine SFH for the southeastern American kestrel. Note that not all of the project habitats listed below fall within a kestrel territory (defined as a 0.31-mile radius around a Habitat Use Centroid).

Table 1 FLUCFCS to FLCC Crosswalk Table

FLUCFCS[1]	FLCC[2]	Associated Kestrel SFH[3] Category	Kestrel SFH[3] (Yes/No)
Residential, Low Density (FLUCFCS 110)	Low Intensity Urban (FLCCS 1821)	N/A	No
Improved Pasture (FLUCFCS 211)	Improved Pasture (FLCCS 183313)	Agriculture-Cropland/Pasture (FLCCS 18331)	Yes
Improved Pasture (OSW) (FLUCFCS 211o)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Woodland Pasture (FLUCFCS 213)	Unimproved/Woodland Pasture (FLCCS 183314)	Agriculture-Cropland/Pasture (FLCCS 18331)	Yes
Woodland Pasture (OSW) (FLUCFCS 213o)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Field Crops (FLUCFCS 215)	Field Crops (FLCCS 183312)	Agriculture-Cropland/Pasture (FLCCS 18331)	Yes
Field Crops (OSW) (FLUCFCS 215o)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Tree Crops (FLUCFCS 220)	Citrus (FLCCS 183321)	N/A	No
Citrus Groves (FLUCFCS 221)	Citrus (FLCCS 183321)	N/A	No
Specialty Farms (FLUCFCS 250)	Specialty Farms (FLCCS 183352)	N/A	No
Dairies (FLUCFCS 252)	Feeding Operations (FLCCS 183351)	Agriculture-Cropland/Pasture (FLCCS 18331)	Yes
Dairies (OSW) (FLUCFCS 252o)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Other Open Lands (FLUCFCS 260)	Other Open Lands - Rural (FLCCS 183315)	Agriculture-Cropland/Pasture (FLCCS 18331)	Yes
Shrub and Brushland (FLUCFCS 320)	Scrub (FLCCS 1210)	Scrub (FLCCS 1210)	Yes
Pine Flatwoods (FLUCFCS 411)	Rural Open Pine (FLCC 18312)	Rural Open Pine (FLCC 18312)	Yes
Live Oak (FLUCFCS 427)	Live Oak (FLCCS 1123)	N/A	No

FLUCFCS[1]	FLCC[2]	Associated Kestrel SFH[3] Category	Kestrel SFH[3] (Yes/No)
Hardwood-Conifer Mixed (FLUCFCS 434)	Upland Mixed Woodland (FLCCS 1220)	N/A	No
Hardwood-Conifer Mixed (OSW) (FLUCFCS 434o)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Coniferous Plantation (FLUCFCS 441)	Upland Coniferous (FLCCS 1230)	Upland Coniferous (FLCCS 1230)	Yes
Wetland Cut Ditch (FLUCFCS 513)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Upland Cut Ditch (FLUCFCS 514)	Ditch/Artificial Intermittent Stream (FLCCS 4220)	N/A	No
Reservoir (Up) (FLUCFCS 534 Up)	Artificial Impoundment/Reservoir (FLCCS 3220)	N/A	No
Reservoir (Wet) (FLUCFCS 534 Wet)	Artificial Impoundment/Reservoir (FLCCS 3220)	N/A	No
Cattle Waste Pond (Up) (FLUCFCS 535 Up)	Artificial/Farm Pond (FLCCS 3210)	N/A	No
Cattle Waste Pond (Wet) (FLUCFCS 535 Wet)	Artificial/Farm Pond (FLCCS 3210)	N/A	No
Bay Swamps (FLUCFCS 611)	Bay Swamp (FLCCS 22311)	N/A	No
Streams and Lake Swamps (Bottomland) (FLUCFCS 615)	Bottomland Forest (FLCCS 22331)	N/A	No
Mixed Wetland Hardwoods (FLUCFCS 617)	Mixed Wetland Hardwoods (FLCCS 2233)	N/A	No
Wetland Forested Mixed (FLUCFCS 630)	Other Wetland Forested Mixed (FLCCS 2240)	N/A	No
Freshwater Marsh (FLUCFCS 641)	Marshes (FLCCS 2120)	N/A	No
Shrub Marsh (FLUCFCS 647)	Mixed Scrub-Shrub Wetland (FLCC 2112)	N/A	No
Wet Pasture (FLUCFCS 648)	Grazed Wetlands (FLCCS 2430)	N/A	No
Spoil Areas (FLUCFCS 743)	Spoil Area (FLCCS 1877)	N/A	No
Roads (FLUCFCS 814)	Roads (FLCCS 1841)	N/A	No

1-Florida Land Use, Cover and Forms Classification System (1999)
2-Florida Land Cover Classification System (2018)
3-Suitable Foraging Habitat

4.0 SURVEY RESULTS

The species-specific southeastern American kestrel survey consisted of three survey days conducted on April 15, April 22, and April 28, 2022, in accordance with the survey methodology from the Guidelines. Surveys were performed by multiple ecologists to ensure coverage of the entire project area. Sunrise times and weather conditions were determined via The Weather Channel. Weather conditions including temperature, wind speed and direction, visibility, and precipitation were recorded for each survey day. Surveys were performed during suitable weather conditions that should not affect survey results. Survey details are summarized in Table 2 below.

Table 2 Southeastern American Kestrel Survey Summary

Date	Surveyors	Survey Time		Weather Conditions	
		Start	Finish	Start	Finish
4/15/2022	Robert Wiwi, Michael Grzywacz	7:01	14:15	Temperature: 70°F Wind: S 2 mph Visibility: 8 mi Precipitation: None	Temperature: 87°F Wind: NNE 6 mph Visibility: 10 mi Precipitation: None
4/22/2022	Camille Knight, Ryan Countess, Michaela Blake	6:55	10:55	Temperature: 62°F Wind: NNE 7 mph Visibility: 10 mi Precipitation: None	Temperature: 78°F Wind: ENE 17 mph Visibility: 10 mi Precipitation: None
4/28/2022	Ashlie DaCruz, Ryan Countess, Gabriella Balsam, Andria McMaugh	6:49	10:49	Temperature: 67°F Wind: SW 4 mph Visibility: 6 mi Precipitation: None	Temperature: 79°F Wind: SW 8 mph Visibility: 10 mi Precipitation: None

4.1 Southeastern American Kestrel Occurrence

All kestrel observation points, as well as suitable and active nest cavities were recorded with a GPS and depicted on the Southeastern American Kestrel Survey Map. Table 3, shown below, summarizes the results of each survey event.

Table 3 Southeastern American Kestrel Survey Observation Summary

Date	Age	Sex	Observations
4/15/2022	Adult	Unknown	One adult briefly observed flying/hunting but not hovering
4/15/2022	Adult	Unknown	Adult observed perched on transmission line next to County Line Rd. Then observed hunting and eating over citrus grove.
4/15/2022	Adult	Unknown	Nest box observed on transmission line. Adult flew from nest box & perched on transmission line N of nest box. Then circled around & perched S of nest box on transmission line.

Date	Age	Sex	Observations
4/15/2022	Adult	Unknown	Adult observed foraging over pasture. Circled pasture & perched briefly on swamp tupelo before flying W. No suitable cavities observed in vicinity.
4/15/2022	Adult	Unknown	Adult flew from vicinity of nest cavity in wood pole SW across road. Returned and perched on transmission line south of cavity. Circled pasture & perched again. Then flew to cavity & entered cavity.
4/15/2022	2 Adults	Male, Female	Nest box observed on transmission line with two adults perched next to it on transmission line. One had food in its beak and flew into nest box.
4/22/2022	Adult	Female	Observed perched on transmission pole before flying N offsite
4/22/2022	Adult	Male	Observed hovering over pasture before flying far offsite
4/22/2022	Juvenile	Unknown	Observed hunting/hovering near potential nest cavity W of corridor on Maude Rd
4/22/2022	Adult	Male	Adult perched on pole on Mel Smith Rd
4/22/2022	2 Adults	Male, Female	Adults scattered and flew E into Pine Flatwoods off Mel Smith Rd
4/22/2022	Adult	Male	Adult perched on transmission line near cavity, then flew E across pasture
4/28/2022	Adult	Female	One adult observed perched on transmission line
4/28/2022	Adult	Male	Observed hunting and hovering
4/28/2022	Adult	Female	Observed perched on transmission line near nest box on transmission line
4/28/2022	Adult	Male, Female	Both perched on transmission line near suitable cavities
4/28/2022	Adult	Male	Perched on transmission line near suitable cavities

In accordance with the Guidelines, Flatwoods plotted the kestrel sightings from all surveys conducted to calculate the average of the latitudes and the average of the longitudes to determine the Habitat Use Centroid. Kestrel sightings greater than 0.31 miles (0.50-kilometer) away from each other are considered different territories. To determine if a group of sightings were part of one territory, each sighting was buffered with an 820 feet (0.25-kilometer) radius. Sightings where the 820-foot buffer intersect were considered a single territory. A 0.31-mile radius around the Habitat Use Centroid was used to determine a kestrel territory. Based on the results of the survey, it was determined that 11 southeastern American kestrel territories are present within the project area (Habitat Use Centroid Map).

Of those 11 territories, three were observed with active nest cavities, located in both roadside wooden power poles and nest boxes installed as part of a Duke Energy Florida, LLC transmission line project. Of those three active nests, two are located within the project area and one is located within 490 feet. Several suitable nest cavities were also observed during the surveys. The locations of these cavities are shown on the Southeastern American Kestrel Survey Map.

For territories where a nest cavity is assumed and falls outside of the project area, Flatwoods determine the total acreage of SFH within 0.31-mile radius of the Habitat Use Centroid to determine if the project would result in significant habitat modification as detailed below.

4.2 Significant Habitat Modification

Potential take of southeastern American kestrels would occur as a result of the project, if the following occur:

1. Inactive Nest Cavity will be removed by the project activities, or
2. Project activities will come within 490 feet of an Active Nest Cavity, or
3. Reduction of SFH to less than 124 acres within a 0.31-mi radius around the Habitat Use Centroid, given available SFH prior to development is 124 acres or more.

To calculate SFH that occurs on site, as well off-site, within the 0.31-mi radius, Flatwoods utilized the mapped SFH within the SFM-EE as listed in Table 1, as well as the FWC CLC Map data for area outside of the project area. Of the 11 kestrel territories, 9 contain greater than 124 acres of SFH in the pre-development condition. As depicted on the Habitat Use Centroid Map, significant habitat modification is anticipated to occur all 9 of the territories that could have significant habitat modification. Per page 11 of the Guidelines, “take” via significant habitat modification is authorized for SFH located within 0.31-mile radius of nest boxes within the transmission corridor.

5.0 MINIMIZATION OPTIONS AND MITIGATION DISCUSSION

A Migratory Bird Nest Removal Permit issued by the FWC will be required if: impacts to the southeastern American kestrel cavity tree, disturbances within 490 feet (150 meters) of an active nest cavity, or significant modification of SFH not otherwise authorized by the Guidelines are proposed. Please note, an activity that results in reduction of SFH to less than 124 acres within a 0.31-mile radius around the Habitat Use Centroid is expected to cause take, unless the SFH within the radius was already less than 124 acres, in which case a reduction in foraging habitat does not constitute take. No disturbance within 490 feet of a suitable nest cavity is allowed without a permit and a protection buffer must be maintained. Removal of a kestrel nest box is authorized without a permit if it was not installed as mitigation but must occur outside of the breeding season when the nest box is inactive. To encourage installation of kestrel nest boxes for conservation, the Guidelines authorize take via significant habitat modification within a 0.31-mile (0.50-kilometer) radius of kestrel nest boxes or other cavities installed for the expressed purpose of attracting kestrels under the following circumstances:

- Nest box installation is coordinated with FWC or a partner program, or
- The nest box is installed on a utility company right-of-way.

The Migratory Bird Nest Removal Permit (also known as an Incidental Take Permit) will allow the removal of a suitable nest cavity once it is deemed inactive. Impacts to active nest cavities are not allowable and are typically only permitted for scientific data collection or health and safety emergencies. Based on the survey results, the project impacts will require Mitigation for Significant Habitat Modification, which also includes removal of an inactive nest cavity. Mitigation for Significant Habitat Modification per the Guidelines can be in the form of scientific benefit: habitat restoration or conservation easement; or a combination of research/monitoring habitat restoration/conservation easements, and/or financial contribution. Another mitigation option includes a financial only contribution of $20,000.00 per kestrel pair (or nest cavity) to the Fish and Wildlife Foundation of Florida's Imperiled Species Permitting Conservation Fund. Note that mitigation is scalable, commensurate with impacts.

In addition, the following minimization measure options should be considered:

- Conducting project activities outside of the breeding season (March 1st – July 31st)
- If project activities cannot take place outside of the breeding season, a 490-foot buffer around the nest cavity will be maintained until the cavity has been deemed inactive
- Retaining active and inactive nest cavities in natural structures,
- Maintaining at least 124 acre (50 hectare) of SFH within a 0.31-mile (0.50-kilometer) radius of a Habitat Use Centroid.

Mosaic will implement a Wildlife Habitat Management Plan (WHMP) to maintain or improve the biological functions of the biological systems on the site as an integrated component of the mining and reclamation plans, in addition to consideration and integration of the mining and reclamation plans for the surrounding and adjacent areas. This includes maintaining viable populations of the native flora and fauna existing on or adjacent to the site during mining. By preserving and managing the highest quality habitats on the site or on adjacent mine sites, these areas serve as source populations to help re-colonize the remainder of the site following completion of reclamation. Furthermore, mining is considered a temporary activity by statute, and habitats will be reclaimed as required. Specifically, the post-reclamation plans for the site include reclamation of upland habitats frequently utilized by kestrels, such as Cropland and Pastureland (FLCCS 18331).

6.0 REFERENCES

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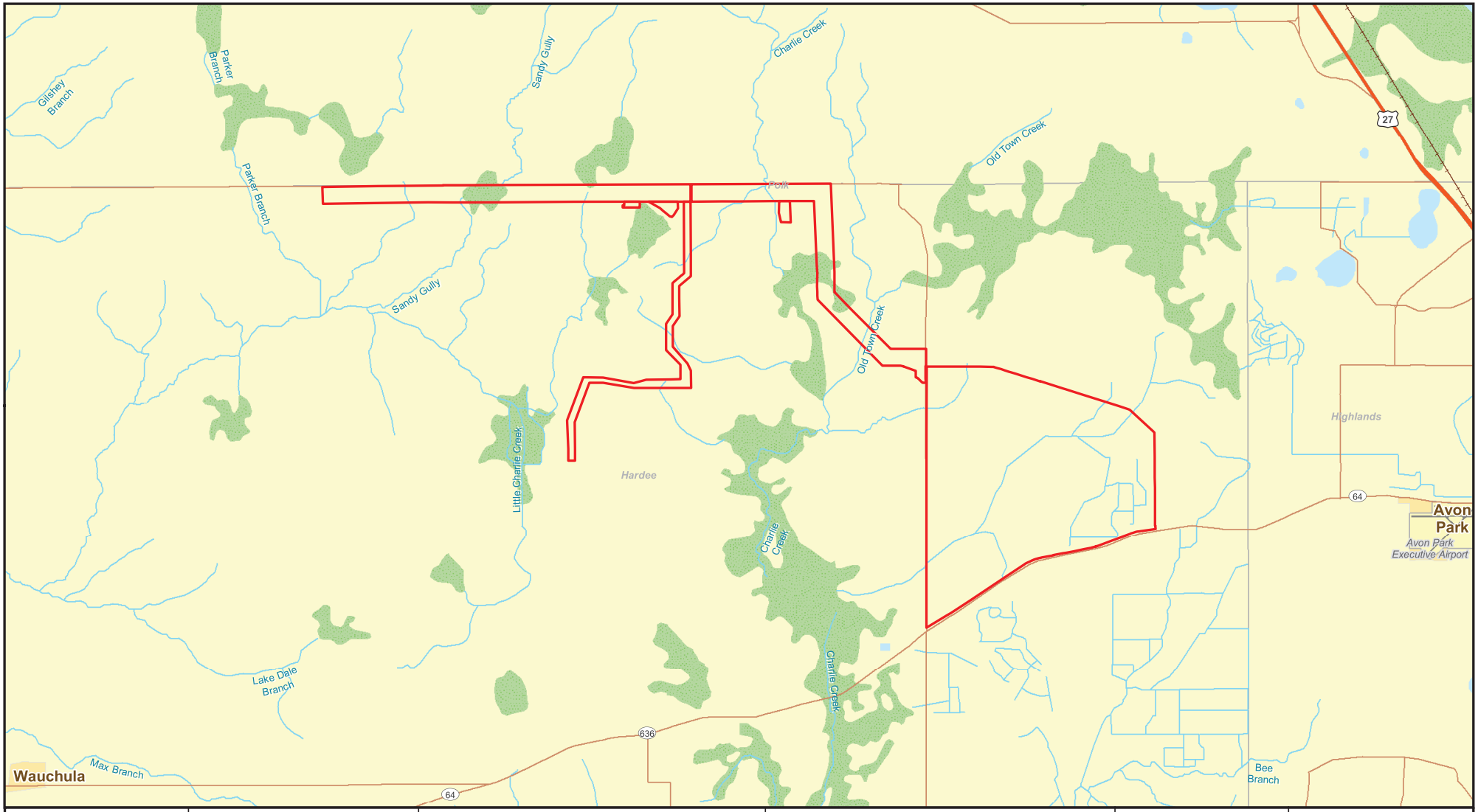
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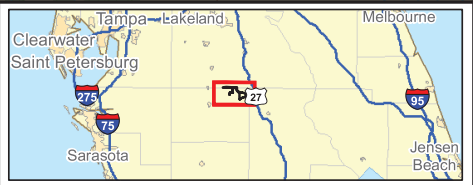
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SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

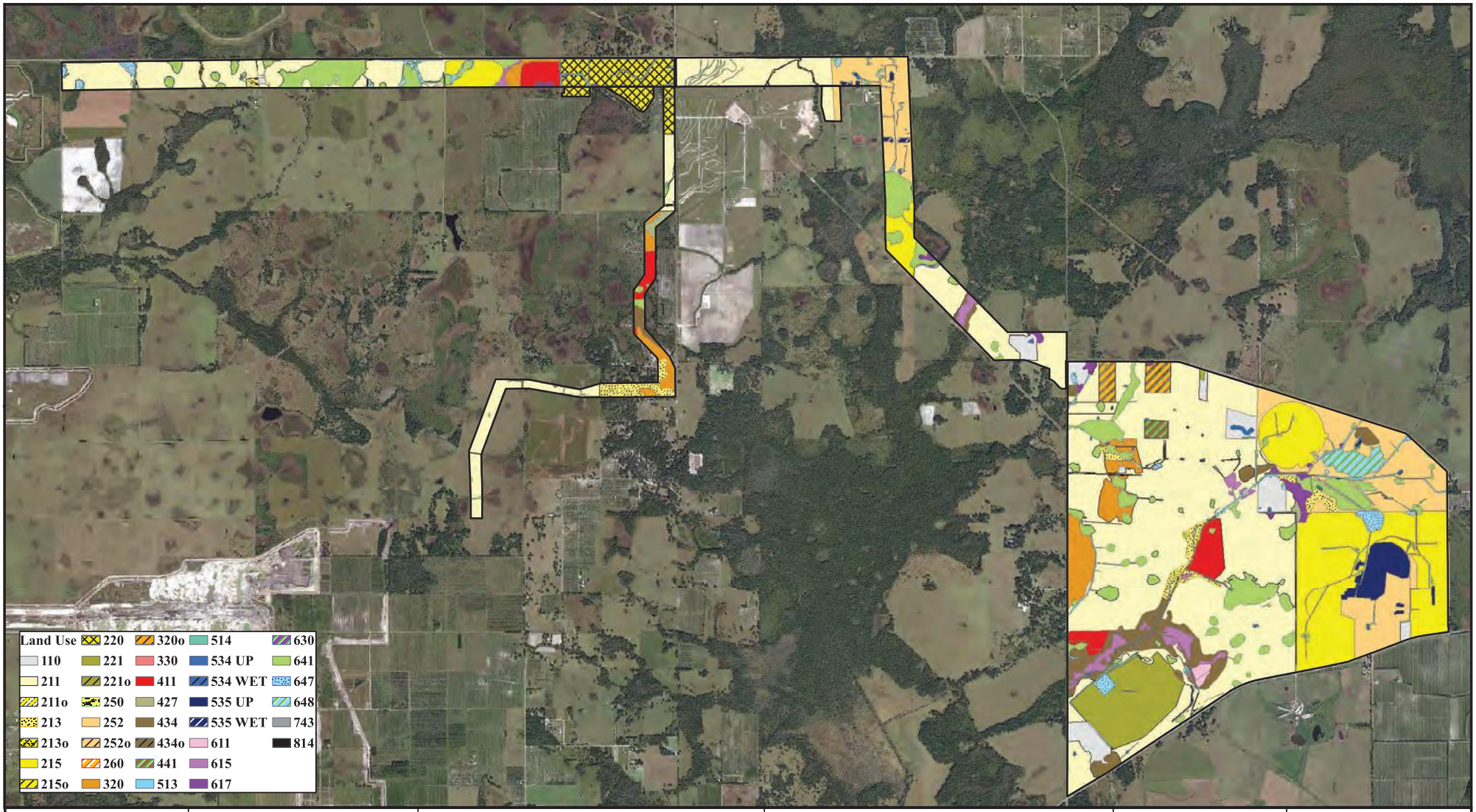
Project Boundary



LOCATION MAP

FLATWOODS Consulting Group

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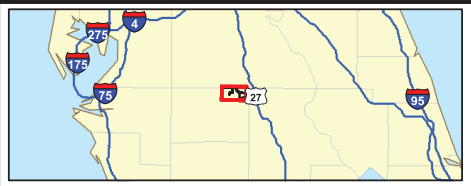
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SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

Project Boundary



EXISTING LAND USE MAP

FLATWOODS Consulting Group

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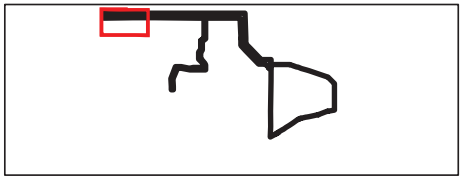
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 1 of 15

FLATWOODS Consulting Group

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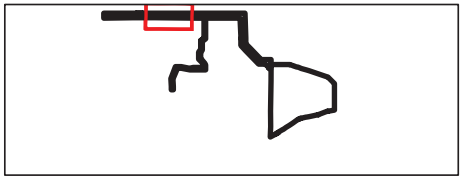
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 2 of 15

FLATWOODS Consulting Group

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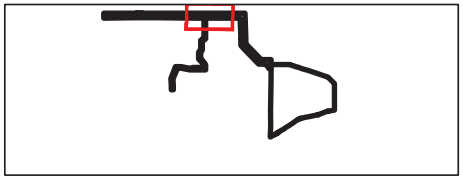
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

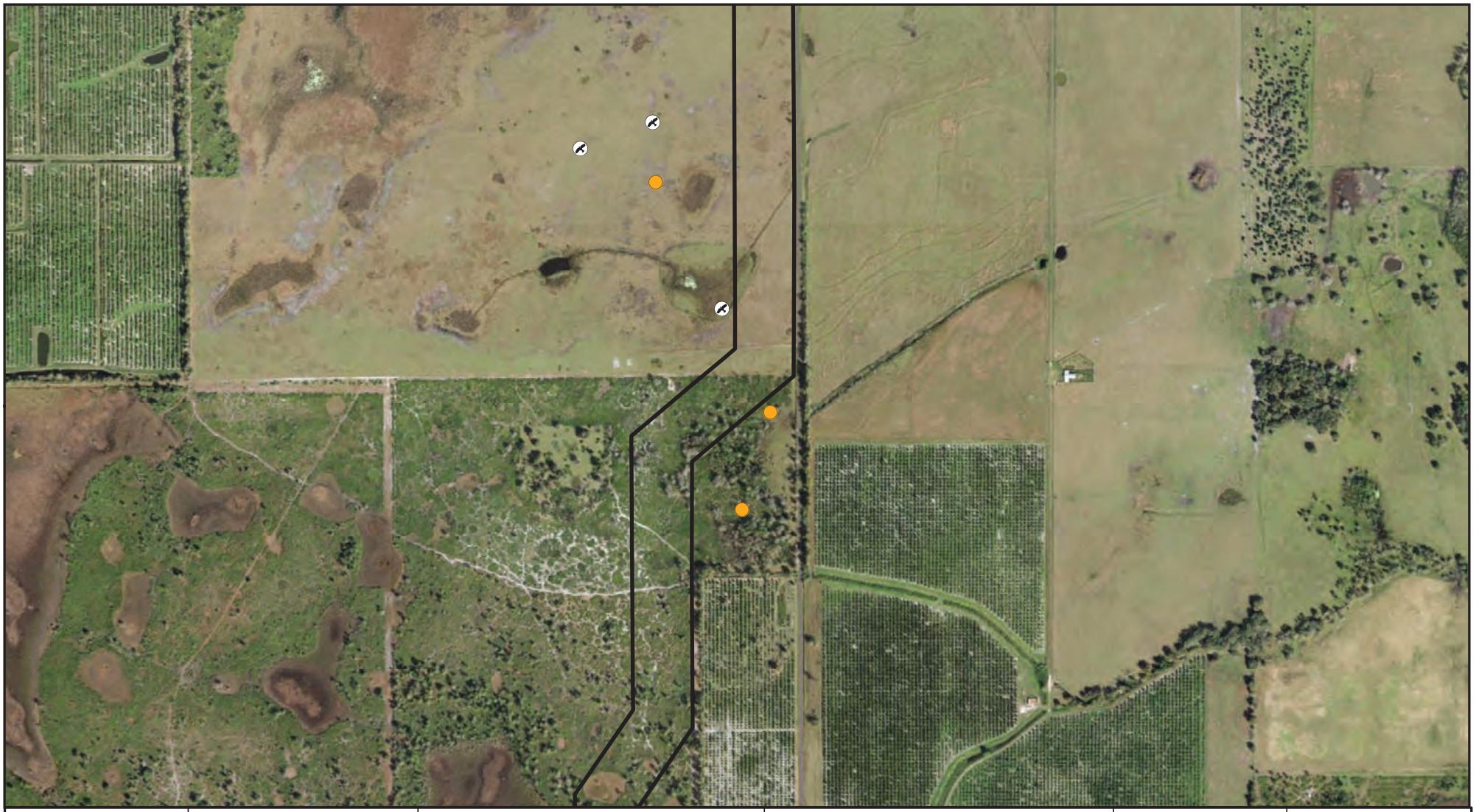
- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 3 of 15

FLATWOODS Consulting Group

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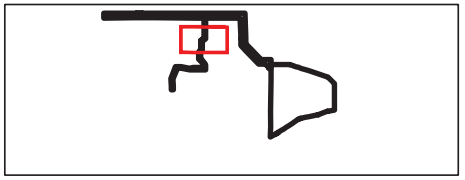
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

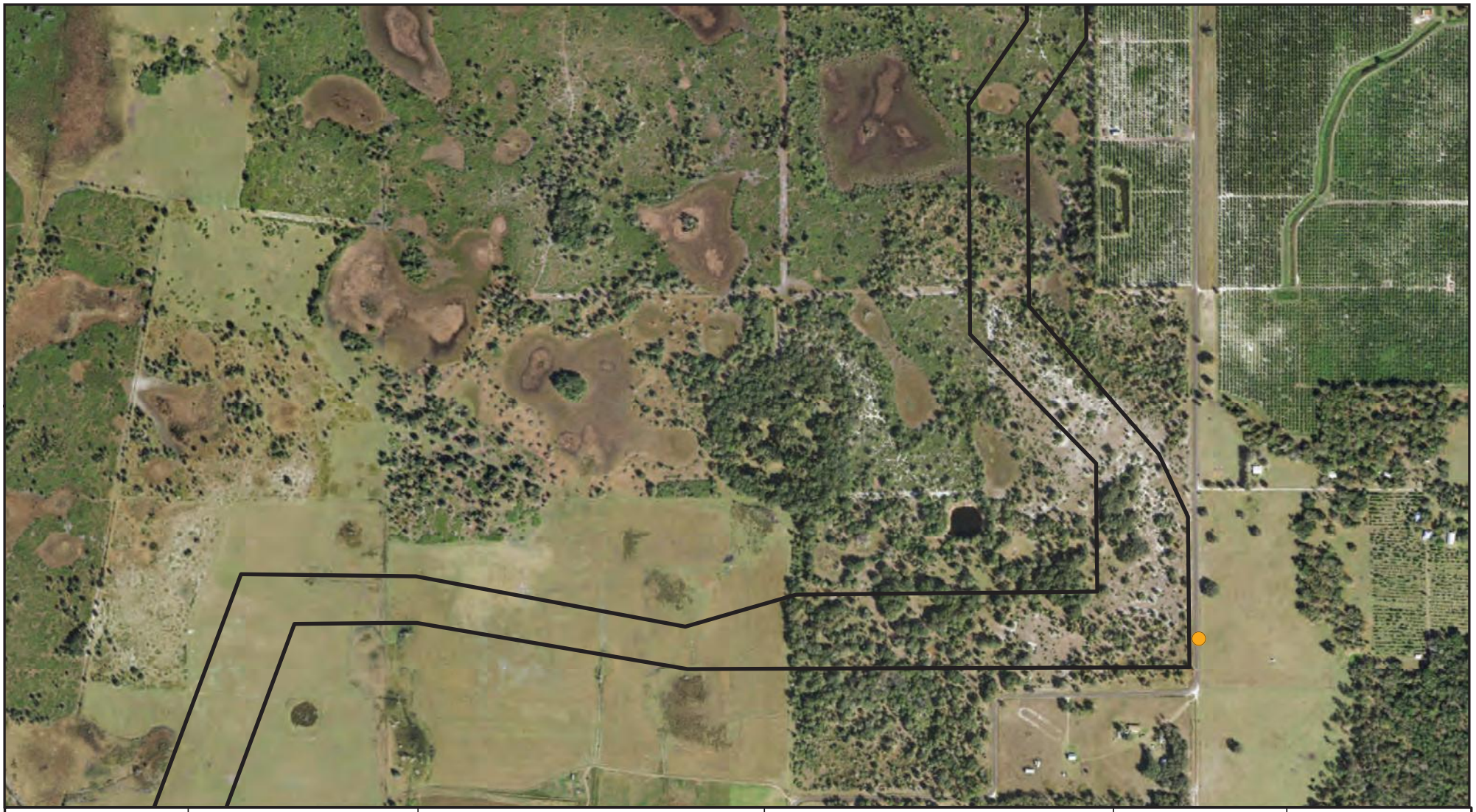
- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 4 of 15

FLATWOODS Consulting Group

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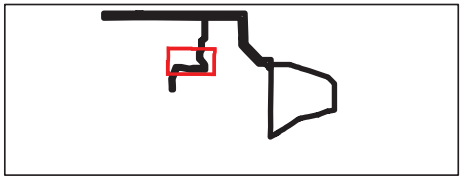
N
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 5 of 15

FLATWOODS Consulting Group

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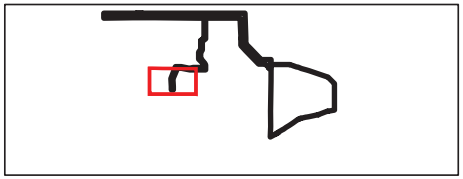
N
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Feet
0 600
1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 6 of 15

FLATWOODS Consulting Group

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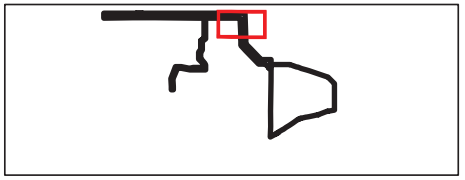
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 7 of 15

FLATWOODS Consulting Group

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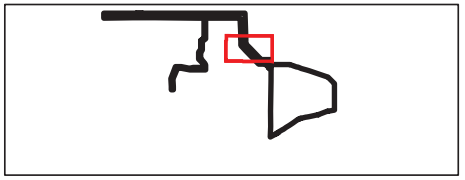
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 8 of 15

FLATWOODS Consulting Group

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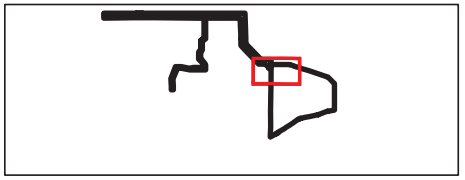
N
W E
S

Feet
0 600
1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 9 of 15

FLATWOODS Consulting Group

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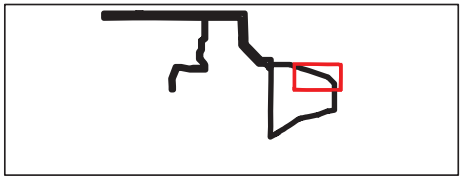
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

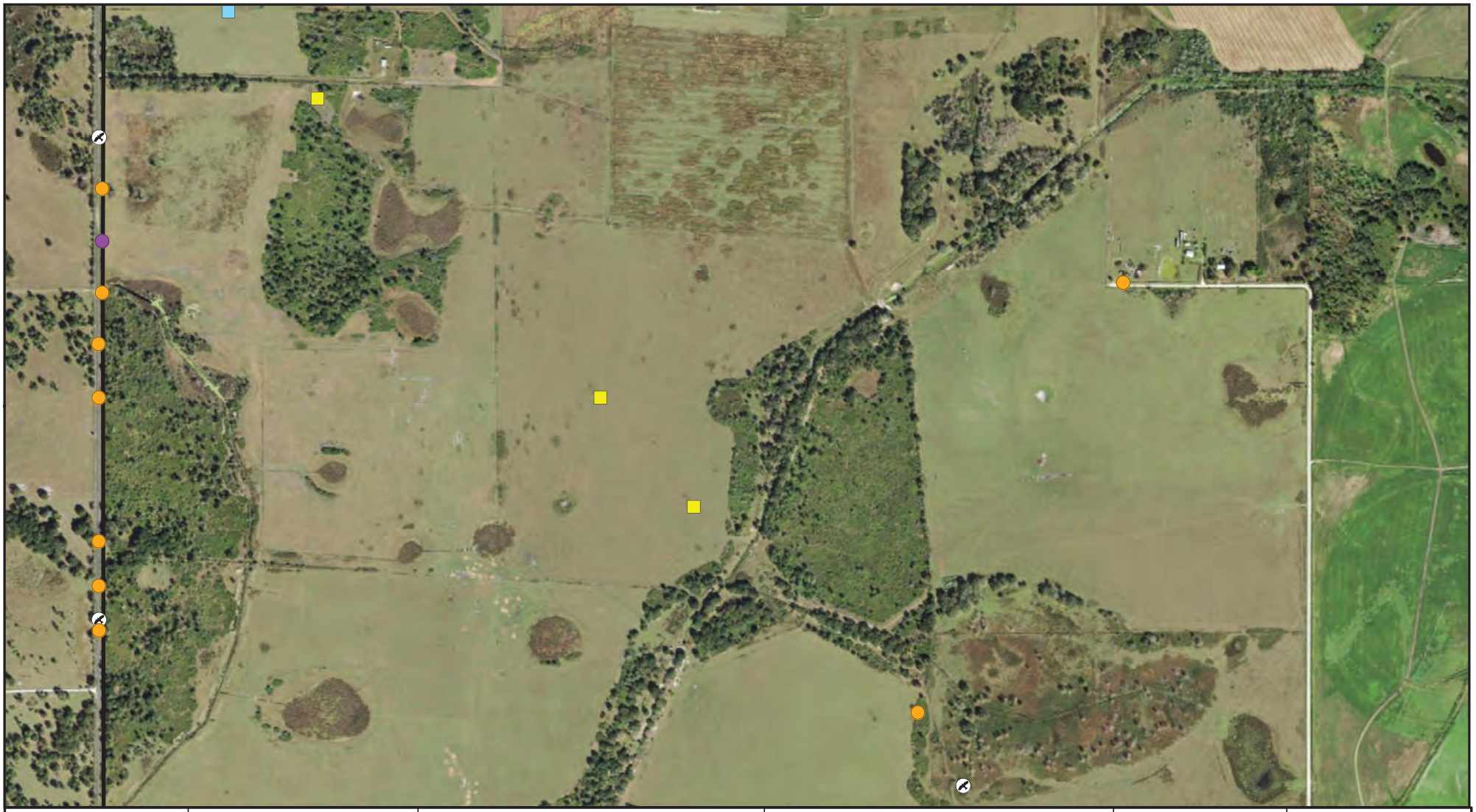
- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 10 of 15

FLATWOODS Consulting Group

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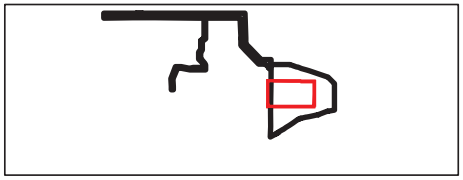
N
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 11 of 15

FLATWOODS Consulting Group

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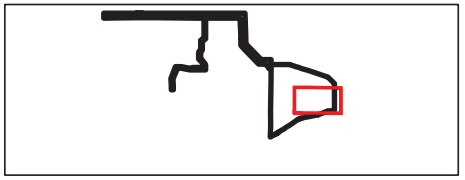
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Feet
0 600
1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 12 of 15

FLATWOODS Consulting Group

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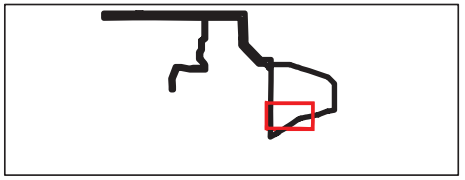
N
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Feet
0 600
1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 13 of 15

FLATWOODS Consulting Group

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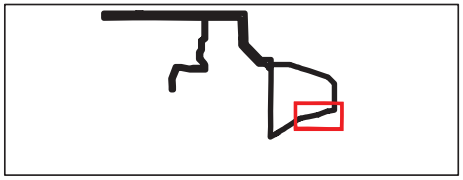
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 14 of 15

FLATWOODS Consulting Group

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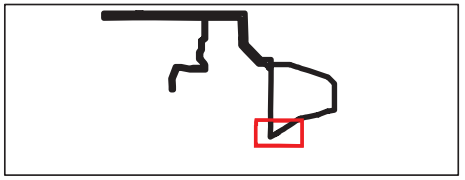
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Feet
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1 in = 600 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

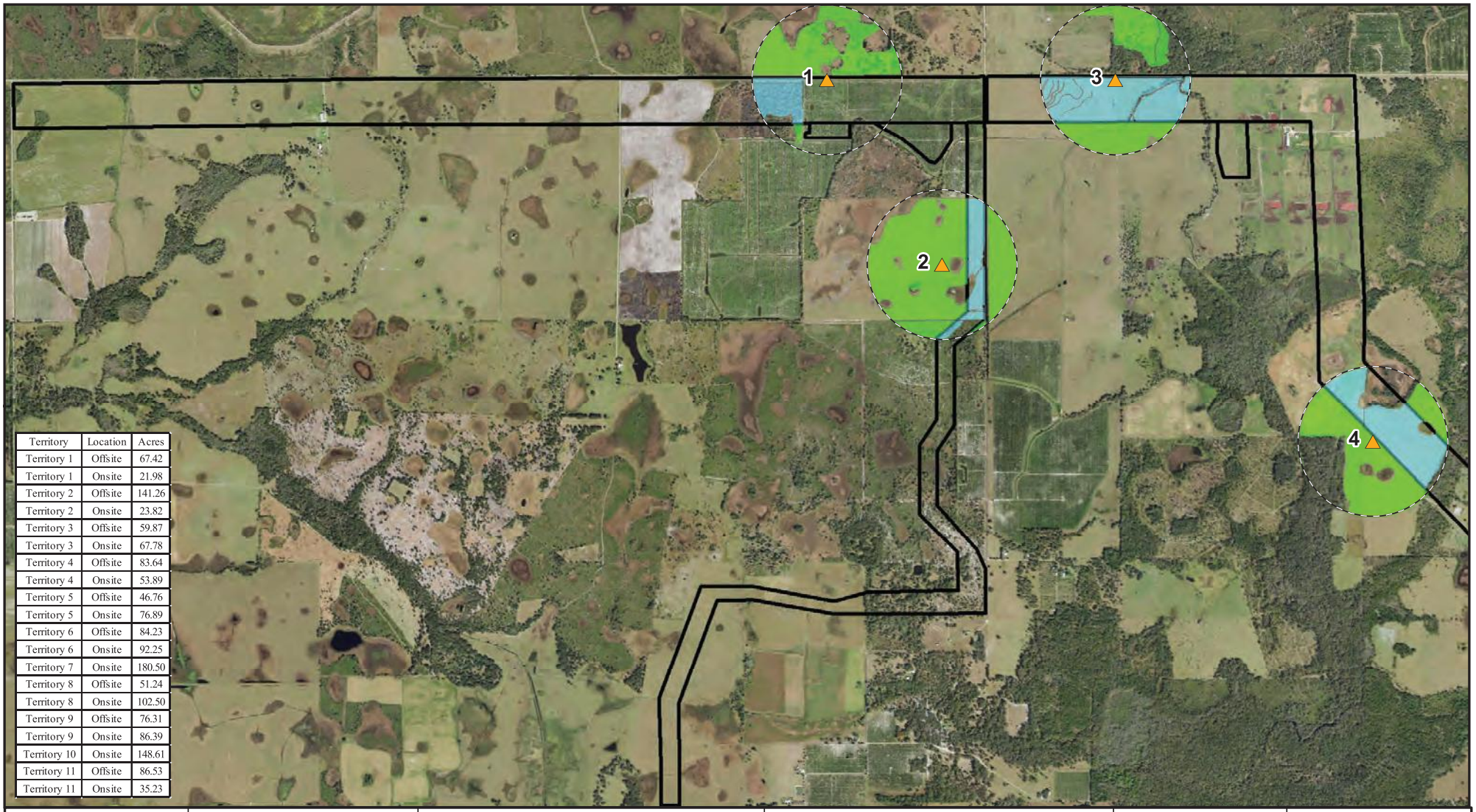
- Inspection Boundary
- Active Kestrel Nest Box
- Kestrel Nest Box
- Active Kestrel Nest Cavity
- Suitable Nest Cavity
- SE American Kestrel Observation



SE AMERICAN KESTREL SURVEY MAP 15 of 15

FLATWOODS Consulting Group

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Territory	Location	Acres
Territory 1	Offsite	67.42
Territory 1	Onsite	21.98
Territory 2	Offsite	141.26
Territory 2	Onsite	23.82
Territory 3	Offsite	59.87
Territory 3	Onsite	67.78
Territory 4	Offsite	83.64
Territory 4	Onsite	53.89
Territory 5	Offsite	46.76
Territory 5	Onsite	76.89
Territory 6	Offsite	84.23
Territory 6	Onsite	92.25
Territory 7	Onsite	180.50
Territory 8	Offsite	51.24
Territory 8	Onsite	102.50
Territory 9	Offsite	76.31
Territory 9	Onsite	86.39
Territory 10	Onsite	148.61
Territory 11	Offsite	86.53
Territory 11	Onsite	35.23

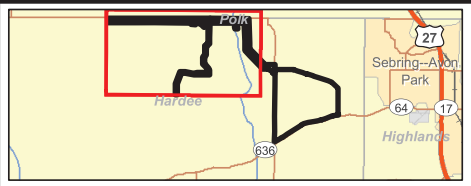
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Feet
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1 in = 2,000 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

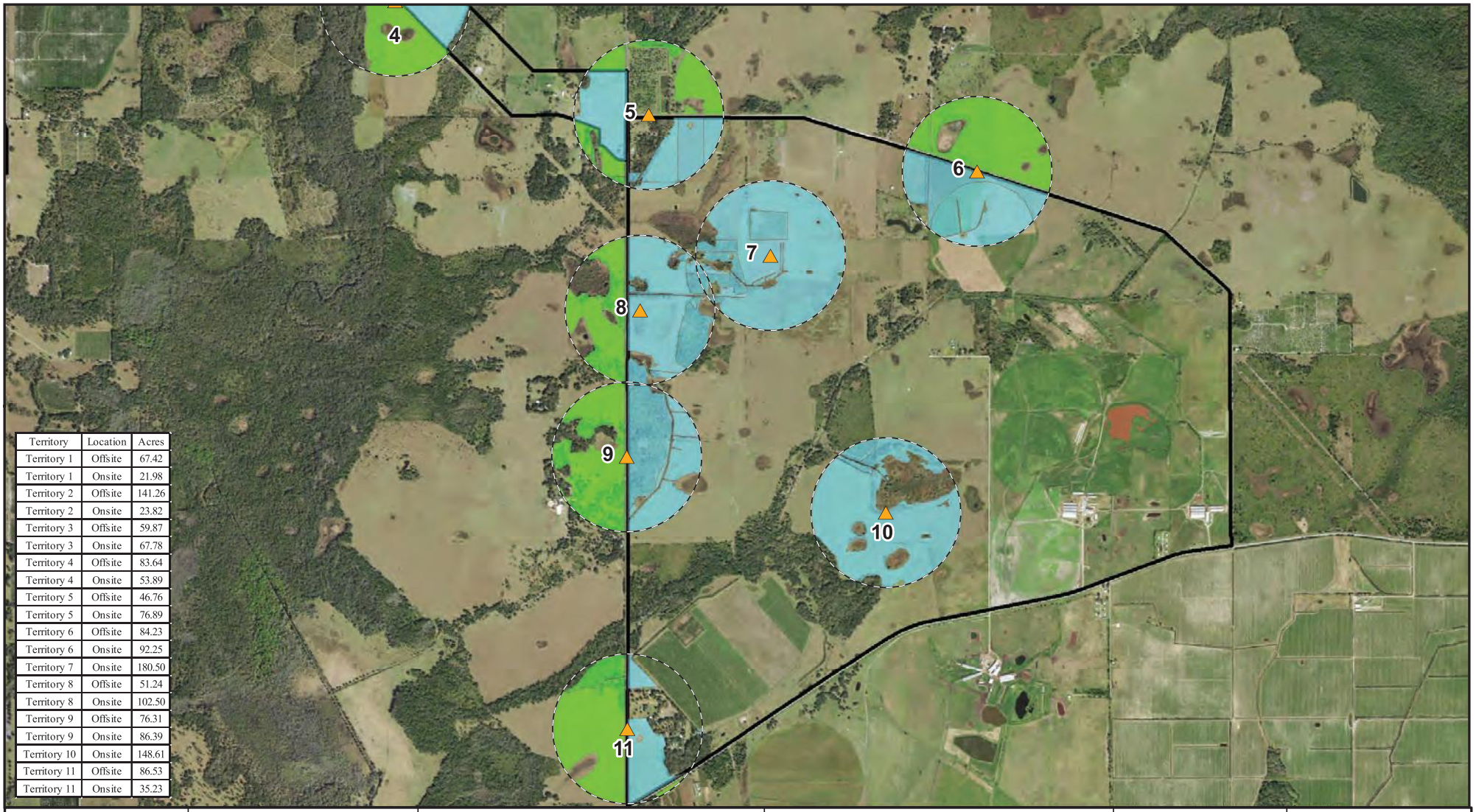
- Kestrel Centroid
- 0.31 Mile Buffer
- Offsite Suitable Foraging Habitat
- Onsite Suitable Foraging Habitat
- Project Area



HABITAT USE CENTROID MAP 1 OF 2

FLATWOODS Consulting Group

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Territory	Location	Acres
Territory 1	Offsite	67.42
Territory 1	Onsite	21.98
Territory 2	Offsite	141.26
Territory 2	Onsite	23.82
Territory 3	Offsite	59.87
Territory 3	Onsite	67.78
Territory 4	Offsite	83.64
Territory 4	Onsite	53.89
Territory 5	Offsite	46.76
Territory 5	Onsite	76.89
Territory 6	Offsite	84.23
Territory 6	Onsite	92.25
Territory 7	Onsite	180.50
Territory 8	Offsite	51.24
Territory 8	Onsite	102.50
Territory 9	Offsite	76.31
Territory 9	Onsite	86.39
Territory 10	Onsite	148.61
Territory 11	Offsite	86.53
Territory 11	Onsite	35.23

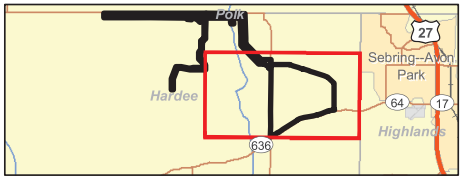
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Feet
0 2,000
1 in = 2,000 feet

SOUTH FORT MEADE EASTERN EXTENSION MOSAIC FERTLIZER LLC.

HARDEE COUNTY, FLORIDA

- Kestrel Centroid
- 0.31 Mile Buffer
- Offsite Suitable Foraging Habitat
- Onsite Suitable Foraging Habitat
- Project Area



HABITAT USE CENTROID MAP 2 OF 2

FLATWOODS Consulting Group

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MOSAIC FERTILIZER, LLC
SOUTHEASTERN AMERICAN KESTREL PROGRAMMATIC PERMIT
UPDATED METHODOLOGY DOCUMENT

Mosaic's Programmatic Permit boundary proposes to cover all of Mosaic's current holdings, which account for approximately 372,066 acres (Mosaic Land). The Mosaic Land that Mosaic currently intends to mine over the next 30 years totals 63,489.8 acres. The methodology used to determine the requested take of 30 southeastern American kestrel (*Falco sparverius paulus*) territories focused on that latter acreage because land disturbance therein is more certain and therefore take more likely; the methodology is described below. The estimate of anticipated incidental take in the original permit application has been superseded by this more conservative methodology, which is discussed below.

Because the amount of take is unknown for a 30-year Programmatic Permit, Mosaic estimated the amount of potential take for the southeastern American kestrel by analyzing survey data collected for the last three years. This data was collected either as pre-clearing surveys or done in the pre-mining phase. All surveys were conducted in accordance with the Species Conservation Measures and Permitting Guidelines for the Southeastern American Kestrel (December 2020). Based on the survey data and acreage of area to be disturbed due to mining activities, Mosaic has estimated and is requesting the take of 30 kestrel pairs over the 30-year permit duration. Table 1 summarizes the mine location, surveyed acreage, and results associated with those surveys for the last three years.

Seventeen territories were observed during fifteen surveys conducted in accordance with the guidelines. Note that of the fifteen surveys conducted, thirteen surveys were pre-clearing surveys conducted in the annual survey period immediately preceding land clearing, while the remaining two surveys were project planning surveys conducted for the entirety of the South Fort Meade – Eastern Extension (SFM-EE) to support permit issuance from the Florida Department of Environmental Protection. Collectively, these surveys represent 12,839 acres and eight years of current and future mining-related activities. The thirteen annual pre-clearing surveys revealed 6 kestrel territories. Of these, mining disturbance resulted in no incidental take because the cavities were all located within nest boxes on power utility structures and/or habitat centroids had less than 124 acres of SFH present pre-mine disturbance. See Table 1 for more details.

The 11 SFM-EE territories were observed during the 2022 project planning surveys for SFM-EE and those where cavities were identified (6) were all using nest boxes on power structures. Mining-related activities in or adjacent to 3 of the 11 territories are reasonably expected to result in significant habitat modification (inclusive of inactive nest cavities) as defined in the Guidelines.

As the upper portion of the table reflects, Mosaic is often able to avoid incidental take of occupied kestrel habitat in its mining operations due to the location of the kestrel territories on power structures. Mosaic nevertheless utilized all kestrel territories observed in both the pre-clearing and planning surveys (12,839 acres) to conservatively project future incidental take over the next 30 years. Specifically, to be conservative, Mosaic is assuming that each 5-year period may result in estimated take similar to that anticipated for SFM-EE, which will be mined in its entirety during the next 5 years, i.e., 3 kestrel pairs due to significant habitat modification of 3 kestrel territories, with a conservative contingency factor of an extra 2 kestrel pairs, as two habitat use centroid analyses, although less than 124 acres were measured at 114 ac and 106 ac. With this conservative estimate in mind, over a 30-year mine life, it is reasonable to project over the 30-year permit life that 30 territories and 30 inactive nest cavities may be impacted, resulting in incidental take of 30 kestrel pairs because of mining-related activities on Mosaic Land.

An alternative approach is to calculate the areas of mine lands 63,489.8 acres and divide by our 3 years of surveyed land, 12,839 acres, and multiply by the number of territories expected to be classified as incidental take based on that survey data (i.e., 5 inclusive of the contingency factor noted above). Using this calculation 63,489.8ac/12,839ac*5 = 25 territories. As southeastern American kestrel are not evenly distributed across the landscape and are likely to be encountered and clustered in some locations more than others Mosaic supports the use of the higher of the two different estimates to be conservative.

As noted above and in the table below, for the first five year permit, based on the pre-clearing surveys previously conducted, it is reasonable to estimate incidental take of 5 kestrel pairs may occur within the first 5-year mine plan under the programmatic permit. Mosaic therefore requests the take of 5 kestrel pairs in the first 5-year permit through harassment or harm due to either removal or destruction of 5 inactive nest cavities or through significant habitat modification of 5 kestrel territories.

Table 1 Southeastern American Kestrel Survey Results

Survey Area	Survey Dates	Project Acres[1]	Kestrels Observed	Significant Habitat Modification	Incidental Take
Pre-clearing Surveys					
Ona Mine – East Horse Creek	April 5, 13, 21, and 26, 2021	1,409	None	NA	NA
Wingate Creek – MYR(3)	May 12, 17, and 24, 2021	331	2 adults/2 juveniles/1 territory	None	None[3]
SFM-ER (1)	May 25, June 2 and 7, 2021	1,992	2 adults/1 territory	None	None
Ona Mine – East and West	May 6, 9, 12, 16, 17, and 24, 2022	2,251	None	NA	NA
SFM-HC Infill	May 9, 16, and 24, 2022	314	None	NA	NA
SFM-ER (2)	May 10, 18, and 25, 2022	690	None	NA	NA
SPE	May 13, 19, and 26, 2022	993	None	NA	Na
Lonesome – MU13	June 30, July 6 and 11, 2022	92	4 adults/2 territories	None	None[3]
SFM-HC - Infill	April 16 and 26 and May 3, 2023	314	2 adults/1 territory	None	None
Wingate Creek	May 4, 9, and 15, 2023	490	1 adult/1 territory	None	None[3]
SPE	May 11, 18, and 22, 2023	1,175	1 unknown age	None	None
Ona	May 12, 12, 17, 18, 22, 23 and 30, 2023	1,314	None	NA	NA
SFM-ER	May 18, 23, and 30, 2023	690	None	NA	NA
Total Kestrels Territories Observed in Pre-clearing Surveys			**6**	**None**	**None**
Project Planning Surveys					
SFM-EE	April 15, 22, and 28, 2022	4,404[5]	18 adults/1 juvenile/11 territories	9 of 11[4]	3 of 11[3]
SFM-EE	April 27 and May 3, 4, 9, 19, 24 and 31, 2023	4,386[5]	67 adults/ 7 territories	3 of 7[4]	3 of 7[3]
Total Kestrel Territories Observed in Project Planning Surveys			**11**[2]	**3**	**3**
Total Kestrel Take Anticipated for the 5-Year Mine Plan + Contingency				**5**	

[1]Total project acreage, not just suitable foraging habitat
[2]Greater of the two surveys used
[3]Some SEAK using a man-made structure (not previous mitigation), therefor removal or modification of the structure is authorized without a permit
[4]Some territories had less than 124 acres SFH and would not result in significant habitat modification.
[5]Acreage variance due to updated boundary lines.

FWS Form 3-202-9 (Rev. 02/2023)
U.S. Department of the Interior

U.S. FISH & WILDLIFE SERVICE - MIGRATORY BIRD PERMIT OFFICE

OMB Control No. 1018-0022
Expires 12/31/2026

MIGRATORY BIRD DEPREDATION - ANNUAL REPORT

Return to: U.S. Fish and Wildlife Service (USFWS)

BEFORE FILLING OUT THIS FORM, please access the Return Addresses (to obtain the email/postal mail addresses where this form can be returned).

Office Use Only
Date Completed Report rec'd in Regional Office
_____/_____/_____
Initials: _____

PERMITTEE: Mosaic Fertilizer, LLC

PERMIT NUMBER: MB37878B

ADDRESS: 13830 Circa Crossing Drive

REPORT FOR CALENDAR YEAR: 2024

REPORT DUE DATE: 1/31/2025

Lithia (City) FL (State) 33547 (Zip Code)

☐ **Check here if reporting a change of name, address, or contact information**

PHONE: 813 446 8657 **Email:**

INSTRUCTIONS: Type or print the information requested below for all birds taken or held under your permit during the year covered by this report and return the completed report to the above address by the due date. Use of this form is not mandatory, but the same information must be submitted, including a signed certification statement. A supplemental sheet is available if needed. Filing an annual report is a condition of your permit. Failure to file a timely report can result in permit suspension. If you had no activity under your permit during the report year, state "No activity" on the form. (50 CFR parts 13, 21, & 22)

MAKE SURE YOU SIGN & DATE THE CERTIFICATION STATEMENT BELOW BEFORE YOU SUBMIT YOUR REPORT.

►Please group your entries first by Species, then by State, County, and Month. Provide a subtotal for each species collected by State. See example below.

Species (Common Name)	When & Where Taken			Quantity			Final Disposition (What you did with the birds/eggs/carcasses? E.g., if killed: destroyed, donated (include name and permit number); if captured: released, relocated, euthanized, transferred (include name and permit number), indicate if injured)
	State	County (or equivalent)	Date	Birds Killed *	Birds Captured	Active Nests Destroyed **	
Example: Ring-billed Gull	VA	Fairfax	3/2	10	0	0	buried
Ring-billed Gull	VA	Chester	JUN	5	0	20	buried
Species Total	VA	-	-	15	0	20	-
Turkey Vulture	FL	Hillsborough	SEPT	6	0	0	Effigy then buried
Black Vulture	FL	Hillsborough	SEPT	4	0	0	Effigy then buried
Black Vulture	FL	Hardee	June	7	0	0	Effigy then buried
Black Vulture	FL	Hardee	Sept	10	0	0	Effigy then buried
Turkey Vulture	FL	Hardee	Sept	11	0	0	Effigy then buried

*** Includes birds trapped and killed ** Refers to nests with eggs that are destroyed, addled (oiled, shaken), or removed from wild. Do not enter individual eggs & do not include inactive nests (nests without eggs) destroyed.**

CERTIFICATION: I certify that the information in this report is true and correct to the best of my knowledge. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

Signature of permittee/Principal Officer. (No stamped signatures. Electronic signatures accepted.)

Date of signature (mm/dd/yyyy)

OMB Control No. 1018-0022
Expires 12/31/2026

PERMITTEE: _____ **PERMIT NUMBER:** _____ **REPORT YEAR:** _____ **SUPPLEMENTAL PAGE NO:** ____

Species (Common Name)	**When & Where Taken** State (required)	County (or equivalent) (required)	Date	**Quantity** Birds Killed	Birds Relocated *	Active Nests Destroyed **	**Final Disposition** (What you did with the birds, eggs, carcasses: buried, incinerated, transferred (specify to whom), released, or other (specify))

*** Relocated in the wild ** Refers to nests with eggs that are destroyed, addled (oiled/shaken) or removed from wild. Do not enter individual eggs & do not include inactive nests (nests without eggs) destroyed.**

OMB Control No. 1018-0022
Expires 12/31/2026

NOTICES

PRIVACY ACT STATEMENT

Authority: The information requested is authorized by the following: the Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22; the Endangered Species Act (16 U.S.C. 1531-1544), 50 CFR 17; the Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21; the Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15; the Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16; Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), 50 CFR 23; General Provisions, 50 CFR 10; General Permit Procedures, 50 CFR 13; and Wildlife Provisions (Import/export/transport), 50 CFR 14.

Purpose: The collection of contact information is to verify the individual has an eligible permit to conduct activities which affect protected species. The information the individual provides helps the FWS monitor and report on protected species and assesses the impact of permitted activities on the conservation and management of species and their habitats.

Routine Uses: The collected information may be used to verify an applicant's eligibility for a permit to conduct activities with protected wildlife; to provide the public and the permittees with permit related information; to monitor activities under a permit; to analyze data and produce reports to monitor the use of protected wildlife; to assess the impact of permitted activities on the conservation and management of protected species and their habitats; and to evaluate the effectiveness of the permit programs. More information about routine uses can be found in the System of Records Notice, Permits System, FWS-21.

Disclosure: The information requested in this form is voluntary. However, submission of requested information is required to process applications for permits authorized under the listed authorities. Failure to provide the requested information may be sufficient cause for the U.S. Fish & Wildlife Service to deny the request.

PAPERWORK REDUCTION ACT STATEMENT

In accordance with the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the U.S. Fish and Wildlife Service collects information necessary to monitor take and disposition of migratory birds, under the applicable laws governing the requested activity, for which a permit is requested, and to respond to requests made under the Freedom of Information Act and the Privacy Act of 1974. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. OMB has approved this collection of information and assigned Control No. 1018-0022.

ESTIMATED BURDEN STATEMENT

We estimate public reporting for this collection of information averages:

Original submission - paper-based: 48 minutes (reporting) and 12 minutes (recordkeeping)
Original submission - electronic: 30 minutes (reporting) and 15 minutes (recordkeeping)

These estimates include time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, Fish and Wildlife Service, U.S. Department of the Interior, 5275 Leesburg Pike, MS: PRB (JAO/3W), Falls Church, VA 22041-3803, or via email at Info_Coll@fws.gov. **Please do not send your completed form to this address.** Questions regarding migratory bird permits should be sent to the appropriate regional (contact information can be found at https://www.fws.gov/program/migratory-bird-permits/contact-us).

FREEDOM OF INFORMATION ACT

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.26 – 2.33].

SECTION 2

SIGNIFICANT UPLAND WILDLIFE HABITAT & WILDLIFE SUMMARY SUWH MONITORING REPORT ENVIRONMETAL REPORT WILDLIFE REPORTS & PERMITS



The Mosaic Company

Hillsborough County Consolidated Mines
DRI 263

2024/2025 Annual Report

SIGNIFICANT WILDLIFE HABITAT

In accordance with Condition I.14 of the approved DRI 263 Development Order the following is an update of:

1.) SUWH reclamation status within the Extension Areas of DRI 263 and;
2.) Wildlife relocation activity for the current reporting period

SIGNIFICANT UPLAND WILDLIFE HABITAT

(July 1, 2019 – June 30, 2025 Update)

In accordance with the Hillsborough County Reclamation Manual (HCRM) and/or the Significant Upland Wildlife Habitat Mitigation Plan, Mosaic is required to reclaim approximately 2,232 acres of land designated as Significant Upland Wildlife Habitat (SUWH). Ongoing discussions with County staff and field reviews conducted in 2021 have identified areas of SUWH that were not impacted and currently the reclamation of SUWH acres is ~2,079 acres. As defined in the above-mentioned Mitigation Plan/Reclamation Manual reclaimed SUWH will be deemed successful once particular vegetative and wildlife criteria have been successfully met.

Discussions with the County Development Services and Conservation & Environmental Lands Management Departments began in 2018 to address the required acreage of SUWH and other land management and conservation goals. This discussion is ongoing with the intent of finalizing acreage, location and final configuration of SUWH. The proposed approach consists of 3 phases: 1) review of approval letters for mining units and determination of baseline impacts, 2) analysis of actual impacts and field verification, and 3) analysis of areas restored to date. Actual impacts and field verifications are complete (2021), and third phase discussions have begun regarding areas to be transferred to the County. Regular meetings have been scheduled to keep this work moving forward.

This approach will help to better ensure all responsibility has been met and better align the SUWH footprint with the County's land management and conservation goals. Once these meetings are final a revised SUWH plan will be provided and reflect revised footprints and acreage. The attached SUWH maps have not been updated to reflect the recent discussions and field inspections as that work has not yet been formally submitted or approved.

Below is a brief summary of the reclamation efforts currently utilized in order to meet the SUWH reclamation success standards.

In 2024-25, Mosaic planted 88 acres with nursery grown containerized plants in the HPB(6) portion of SUWH. During the 2024-25 season all areas previously seeded or top soiled were treated to control nuisance and exotic vegetation. Prescribed burn activity was complete in the HPB(9) area in July of 2024.

(2025-2026 Proposed Activities)

Routine herbicide maintenance for nuisance and exotic plant species will continue in all SUWH areas. Supplemental plantings of desirable native species will be conducted as needed. Additional controlled/prescribed burns are planned for the 2025-26 burn season. As well, initial planting will take place in the SUWH areas within LRU HPB(6) and HPB(9), and supplemental planting will be done in LRU LMR(7) and LMR(6).

WILDLIFE RELOCATION ACTIVITY

Burrowing Owls

No owls were translocated from Hillsborough County during this report period.

Scrub Jays

No scrub jays were translocated from Hillsborough County during the annual report period. Included is the Twenty-Third Annual Florida Scrub Jay Management Activity Report, dated January 2025.

In summary, there are currently 33 family groups consisting of 110 individual scrub-jays being maintained by Mosaic Fertilizer, LLC within the Mosaic Wellfield – Manatee County Duette Preserve - SWFWMD Coker Tract Subpopulation. Furthermore, descendants of translocated birds have dispersed to Little Manatee River State Park, FWC Moody Branch Park, and DEP Wingate State Park. The total regional population now numbers 60+ groups and is growing. USFWS permit criteria requires Mosaic to maintain at least 14 groups. Currently Mosaic is meeting and surpassing USFWS permit criteria. In addition, Mosaic is using the last 23 years of data collection to understand best practices for Florida Scrub-Jay translocations and ascertain if additional measures, such as increased genetic heterogeneity is needed for conservation of this population.

Habitat management activities in 2023 and 2024 included a prescribed burn. Manatee County conducted a prescribed burn in memorandum with Mosaic in MW 1, MW 2, MW 11 (on the North half of Mosaic Wellfield), and MW 12. The second of which was designed to top kill much of the tall oak and shrubs. Large oaks establishing in the palmetto prairie outside of the fire zone were felled, and overall condition of scrub habitat and the adjacent non-scrub habitats at the Mosaic Wellfield were improved. In addition, non-native nuisance species are treated and are currently maintained below 1% at the Wellfield site.

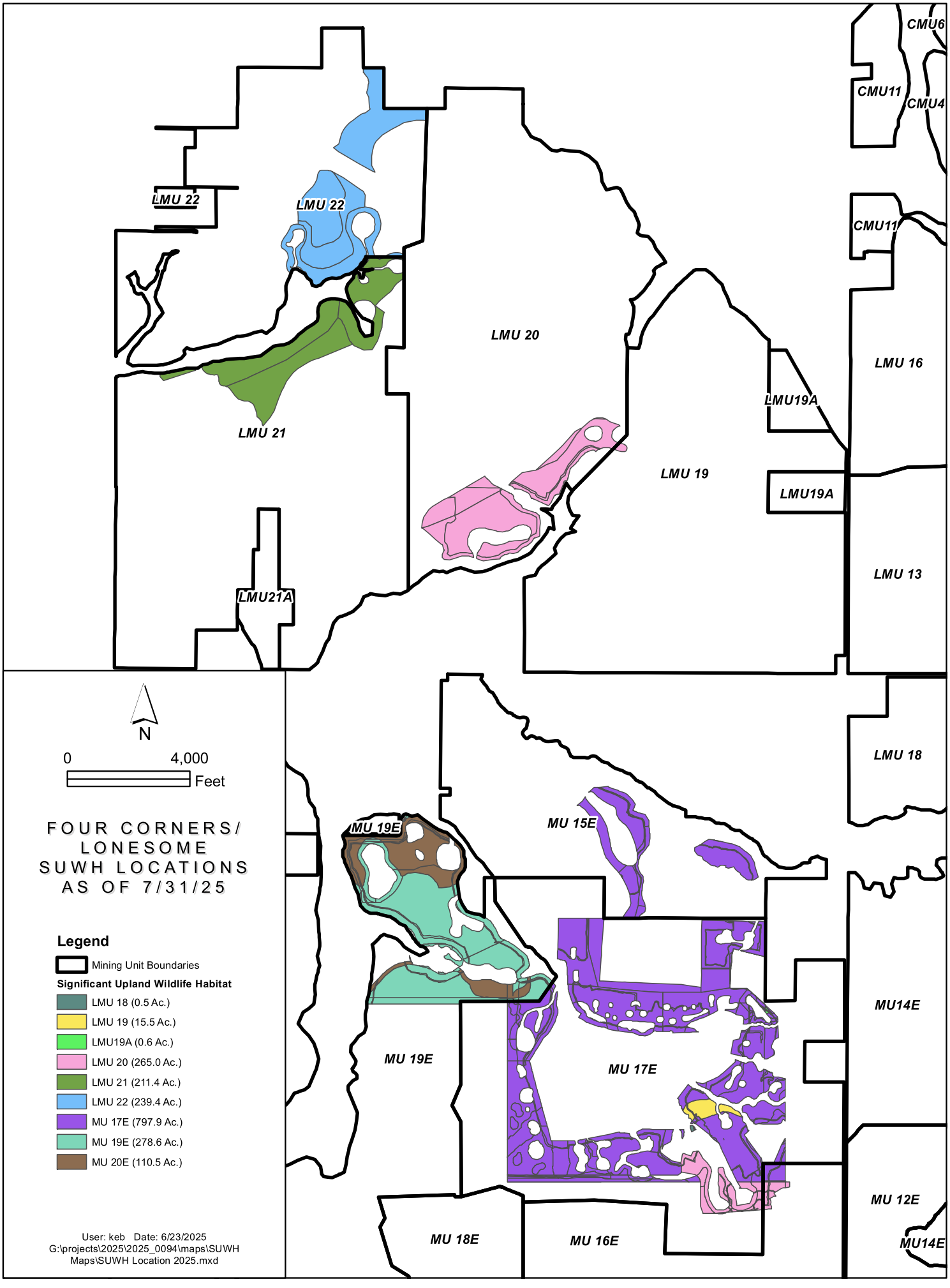
Gopher Tortoises

All relocation of gopher tortoises and commensal species was conducted under the authorization of Florida Fish & Wildlife Conservation Commission (FFWCC) Gopher Tortoise Conservation Permit No. GTC-19-00286B as well as the Restated and Amended Memorandum of Agreement Regarding Gopher Tortoises on Mosaic Land (FWC Contract: 12375) (MOA).

Between 7/1/2024 and 6/30/2025, gopher tortoise surveying and relocations occurred within Hillsborough County at

- Four Corners Mine - Dragline Walkpath
- Four Corners Mine - LMR(10) Berm Removal
- Four Corners Mine - HPB(4) Berm Removal
- Four Corners Mine - Old Clearwater Ditch
- Four Corners Mine - Vector Laydown

A total of 12 gopher tortoises (1 male, 2 females, and 9 subadults) were captured, marked, and then transported and released to the Mosaic Wellfield North long-term protected gopher tortoise recipient site.



FOUR CORNERS/ LONESOME SUWH LOCATIONS AS OF 7/31/25

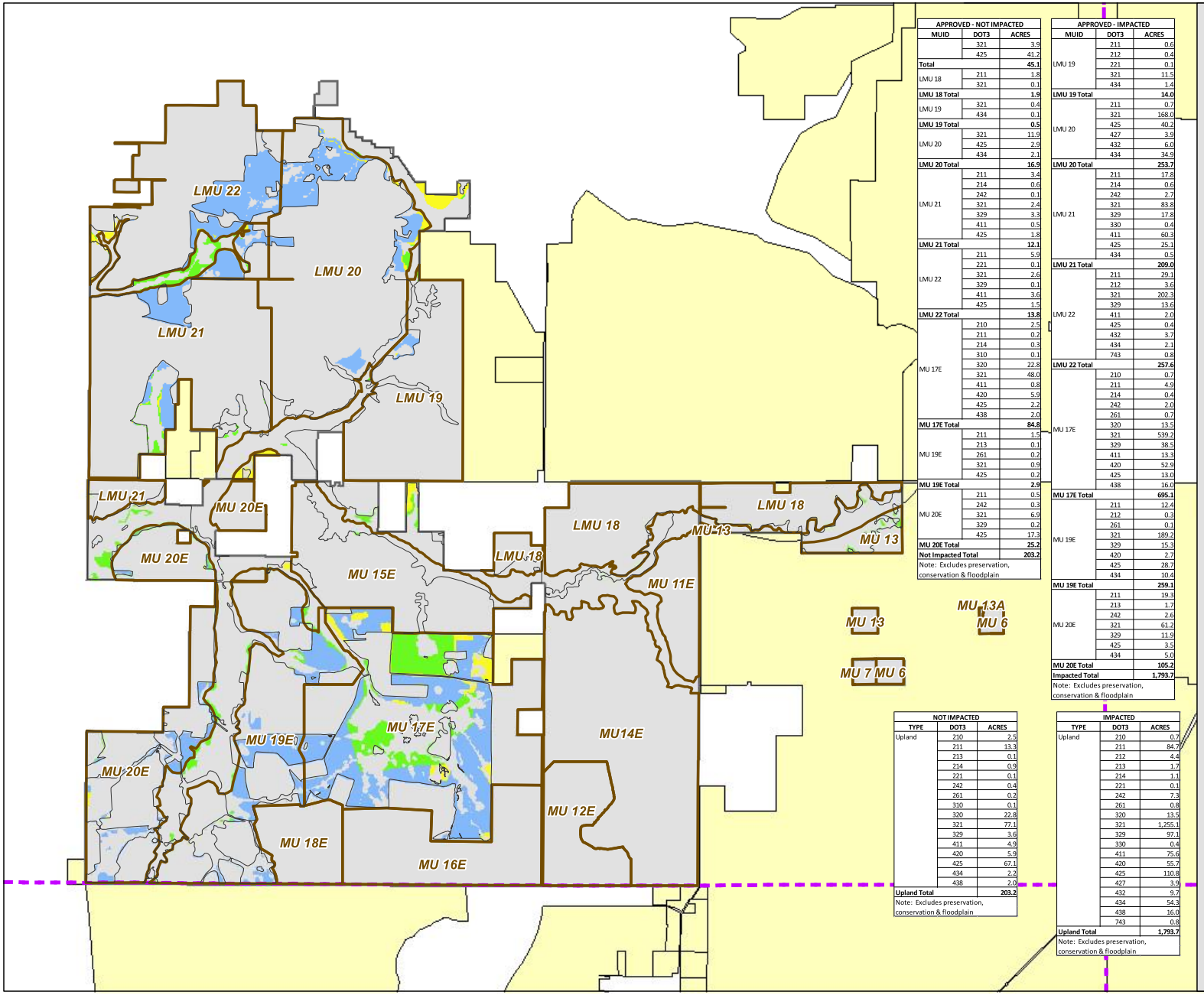
Legend

- Mining Unit Boundaries

Significant Upland Wildlife Habitat

- LMU 18 (0.5 Ac.)
- LMU 19 (15.5 Ac.)
- LMU19A (0.6 Ac.)
- LMU 20 (265.0 Ac.)
- LMU 21 (211.4 Ac.)
- LMU 22 (239.4 Ac.)
- MU 17E (797.9 Ac.)
- MU 19E (278.6 Ac.)
- MU 20E (110.5 Ac.)

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APPROVED - NOT IMPACTED		
MUID	DOT3	ACRES
	321	3.9
	425	41.2
Total		**45.1**
LMU 18	211	1.8
	321	0.1
LMU 18 Total		**1.9**
LMU 19	321	0.4
	434	0.1
LMU 19 Total		**0.5**
LMU 20	321	11.9
	425	2.9
	434	2.1
LMU 20 Total		**16.9**
LMU 21	211	3.4
	214	0.6
	242	0.1
	321	2.4
	329	3.3
	411	0.5
	425	1.8
LMU 21 Total		**12.1**
LMU 22	211	5.9
	221	0.1
	321	2.6
	329	0.1
	411	3.6
	425	1.5
LMU 22 Total		**13.8**
MU 17E	210	2.5
	211	0.2
	214	0.3
	310	0.1
	320	22.8
	321	48.0
	411	0.8
	420	5.9
	425	2.2
	438	2.0
MU 17E Total		**84.8**
MU 19E	211	1.5
	213	0.1
	261	0.2
	321	0.9
	425	0.2
MU 19E Total		**2.9**
MU 20E	211	0.5
	242	0.3
	321	6.9
	329	0.2
	425	17.3
MU 20E Total		**25.2**
Not Impacted Total		**203.2**
Note: Excludes preservation, conservation & floodplain		

APPROVED - IMPACTED		
MUID	DOT3	ACRES
LMU 19	211	0.6
	212	0.4
	221	0.1
	321	11.5
	434	1.4
LMU 19 Total		**14.0**
LMU 20	211	0.7
	321	168.0
	425	40.2
	427	3.9
	432	6.0
	434	34.9
LMU 20 Total		**253.7**
LMU 21	211	17.8
	214	0.6
	242	2.7
	321	83.8
	329	17.8
	330	0.4
	411	60.3
	425	25.1
	434	0.5
LMU 21 Total		**209.0**
LMU 22	211	29.1
	212	3.6
	321	202.3
	329	13.6
	411	2.0
	425	0.4
	432	3.7
	434	2.1
	743	0.8
LMU 22 Total		**257.6**
MU 17E	210	0.7
	211	4.9
	214	0.4
	242	2.0
	261	0.7
	320	13.5
	321	539.2
	329	38.5
	411	13.3
	420	52.9
	425	13.0
	438	16.0
MU 17E Total		**695.1**
MU 19E	211	12.4
	212	0.3
	261	0.1
	321	189.2
	329	15.3
	420	2.7
	425	28.7
	434	10.4
MU 19E Total		**259.1**
MU 20E	211	19.3
	213	1.7
	242	2.6
	321	61.2
	329	11.9
	425	3.5
	434	5.0
MU 20E Total		**105.2**
Impacted Total		**1,793.7**
Note: Excludes preservation, conservation & floodplain		

NOT IMPACTED		
TYPE	DOT3	ACRES
Upland	210	2.5
	211	13.3
	213	0.1
	214	0.9
	221	0.1
	242	0.4
	261	0.2
	310	0.1
	320	22.8
	321	77.1
	329	3.6
	411	4.9
	420	5.9
	425	67.1
	434	2.2
	438	2.0
Upland Total		**203.2**
Note: Excludes preservation, conservation & floodplain		

IMPACTED		
TYPE	DOT3	ACRES
Upland	210	0.7
	211	84.7
	212	4.4
	213	1.7
	214	1.1
	221	0.1
	242	7.3
	261	0.8
	320	13.5
	321	1,255.1
	329	97.1
	330	0.4
	411	75.6
	420	55.7
	425	110.8
	427	3.9
	432	9.7
	434	54.3
	438	16.0
	743	0.8
Upland Total		**1,793.7**
Note: Excludes preservation, conservation & floodplain		

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0 5,000 Feet

Mosaic

Four Corners/Lonesome Mine
DRI 263 - Extension Areas
Pre-mining
Significant Wildlife Habitat Status
Map 71 - 2025

Revised June 23, 2025

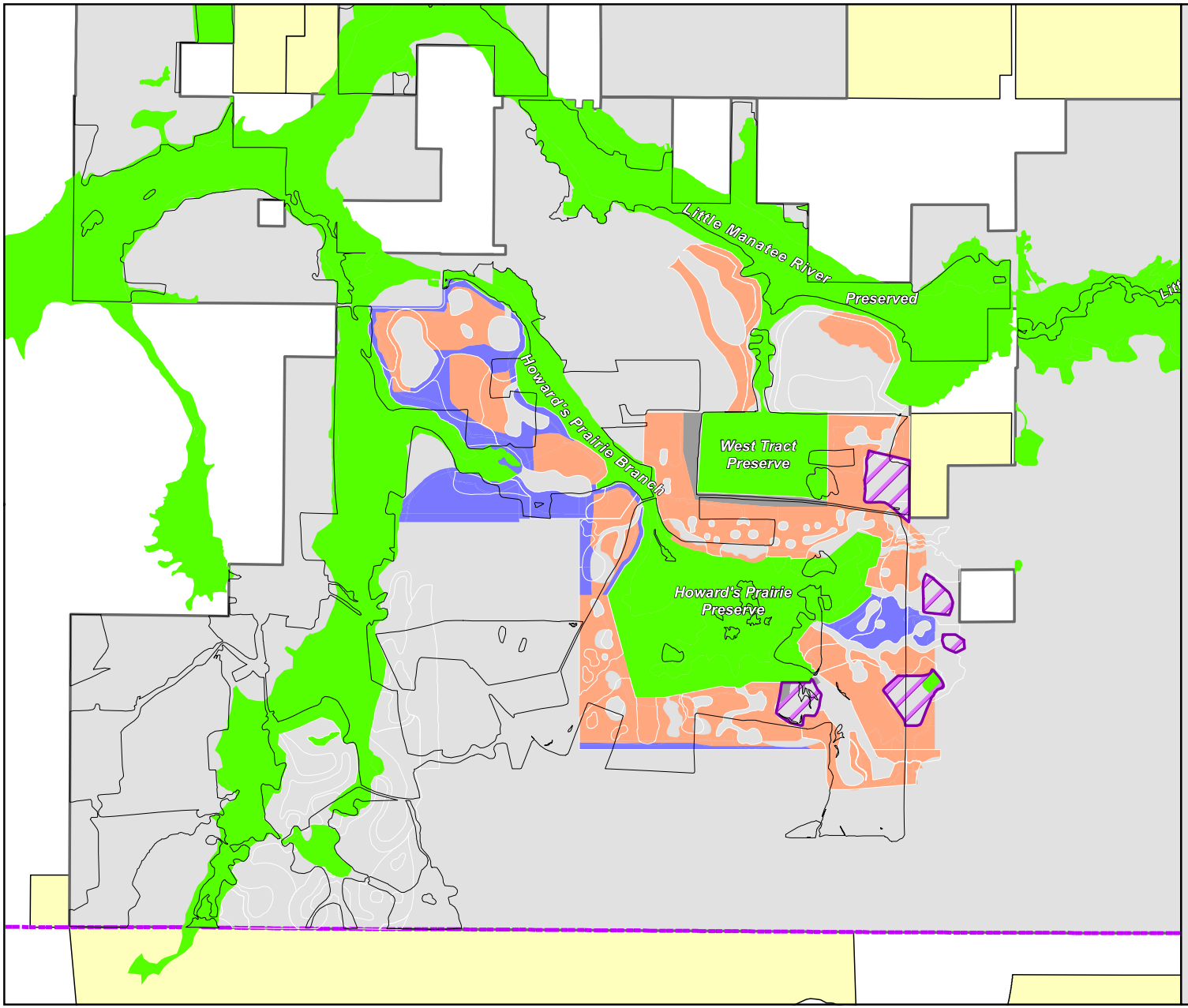
Legend

- County Verified Significant Wildlife Habitat
- Mining Unit Boundaries
- County Lines
- Significant Wildlife Habitat Impacts (Pre 2022)
- Significant Wildlife Habitat Preservation, Conservation & Floodplain
- Significant Wildlife Habitat Not Impacted
- DRI 213 - Extension Areas
- Other Mosaic Holdings

2025 IMPACTS
0.0 UPLAND ACRES

Submitted for 2024/2025
Hillsborough County Annual Report

User: keb Date: 6/23/2025
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N
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0 2,500
Feet

Mosaic

Four Corners/Lonesome Mine
DRI 263 - Extension Areas
Post Reclamation
Significant Wildlife Habitat Progress

- County Verified Significant Wildlife Habitat
- Under Current Conservation Easement by EPCHC
- Approved SUWH Plan *
- Constructed
- To be Constructed
- Not Mined
- Preservation Areas, Conservation Easements & 25 Year Floodplain
- County Lines
- DRI 213 - Extension
- Other Mosaic Holdings

* Approved SUWH Areas - Exact Location Dependent Upon Land Donation Settlement

Submitted for 2024/2025
Hillsborough County Annual Report

User: jlb Date: 6/23/2025
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SUWH MONITORING REPORTS

FOUR CORNERS MINE
ANNUAL MONITORING REPORT

JUNE 2024 (SPRING)
OCTOBER - NOVEMBER 2024 (FALL)

SIGNIFICANT UPLAND WILDLIFE MONITORING
MUs 15E, 16E, 17E, AND 19E

2006 HILLSBOROUGH COUNTY PHOSPHATE MINING RECLAMATION MANUAL

HILLSBOROUGH COUNTY, FLORIDA

Submitted to:

Hillsborough County Florida

601 E. Kennedy Blvd.
Tampa, FL 33602

Submitted by:

Mosaic

13830 Circa Crossing Drive
Lithia, Florida 33547

Prepared by:

KLEINFELDER
Bright People. Right Solutions.

1907 North US Highway 301, Suite 100
Tampa, Florida 33619
(KLF #25001090.001A)

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FOUR CORNERS MINE
ANNUAL MONITORING REPORT
JUNE 2024 (SPRING)
OCTOBER - NOVEMBER 2024 (FALL)
SIGNIFICANT UPLAND WILDLIFE MONITORING
MUs 15E, 16E, 17E, AND 19E
2006 HILLSBOROUGH COUNTY PHOSPHATE MINING RECLAMATION MANUAL
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EXECUTIVE SUMMARY

This annual monitoring report for the Four Corners Mine - Significant Upland Wildlife Habitat (SUWH), MUs 15E, 16E, 17E, and 19E area includes the results for the 2024 Spring and Fall monitoring events. The 2024 Spring Monitoring event was conducted on June 20th, 25th, and 27th 2024. The 2024 Fall Monitoring event was conducted on October 28th-31st and November 1st, 2024. The SUWH will be considered successful when the following conditions are met:

Hillsborough County Phosphate Mining Reclamation Manual (2006) Volume 1.V.B. Release Criteria	Current Status of SUWH Site	Success Criteria Demonstrated
1.Natural plant communities mitigating mapped significant upland habitat must have the species, areal coverage/ projected areal coverage, quantities, and diversity of trees, shrubs, and ground cover consistent with Tables 2, 3, 4, and 5 as appropriate unless other plant lists and/or success criteria are otherwise specified as conditions of approval of the mining unit.	Evaluated in Executive Tables below	Yes
2. The landward extent and areas water ward of the proposed limits for RA wetlands must also meet criteria as described in Chapter 62-340, F.A.C. inclusive of vegetation and evidence of hydrology or hydric soil characteristics.	Site consists of uplands only	NA

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EXECUTIVE SUMMARY (Continued)

Hillsborough County Phosphate Mining Reclamation Manual (2006) Volume 1.V.B. Release Criteria	Current Status of SUWH Site			Success Criteria Demonstrated
	# Spp. Reproducing			
	Land Use (Land Status)	**Spring**	**Fall**	
3. Documentation of the species from each stratum, exclusive of nuisance species, with viable seed set for each of the natural plant communities. Seedlings, saplings, or other 'young' vegetation may be considered proof of flowering and/or viable seed.	Dry Prairie (Reclamation)	78	85	Yes (Yr. 4)
	Dry Prairie (Enhancement)	23	29	Yes (Yr. 4)
	Dry Prairie (Native Area)	32	47	Yes (Yr. 4)
	Pine Flatwoods (Reclamation)	65	71	Yes (Yr. 4)
	Pine Flatwoods (Enhancement)	27	38	Yes (Yr. 4)
	Pine Flatwoods (Native Area)	21	28	Yes (Yr. 4)
	Temperate Hardwoods (Reclamation)	37	37	Yes (Yr. 4)
	Temperate Hardwoods (Enhancement)	23	32	Yes (Yr. 4)
	Temperate Hardwoods (Native Area)	19	25	Yes (Yr. 4)
	Xeric Oak (Reclamation)	19	52	Yes (Yr. 4)
	Xeric Oak (Enhancement)	17	18	Yes (Yr. 4)
	Xeric Oak (Native Area)	12	21	Yes (Yr. 4)

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<table>
<tr><th>Hillsborough County
Phosphate Mining
Reclamation Manual (2006)
Volume 1.V.B. Release Criteria</th><th colspan="3">Current Status of SUWH Site</th><th>Success Criteria
Demonstrated</th></tr>
<tr><td rowspan="16">4. Table 6 provides a list of native vertebrate species known or suspected to occur in HC. These vertebrates form the pool from which representative species can be sampled to evaluate the success of the rehabilitation area. Table 6 includes both the permanent native resident fauna and migratory birds, which depend heavily on the Florida landscape for their survival and are an important component of the consumer food web. Each RA will be evaluated separately unless connected by a wildlife corridor (exclusive of avifauna corridors). Success criteria will only use those vertebrate species appropriate for the plant communities contained within each RA i.e., fish criteria will not be used if the RA consists of only upland plant communities.</td><td colspan="3">Number of Hillsborough County Native Vertebrates</td><td rowspan="16"></td></tr>
<tr><td>Land Use (Land Status)</td><td>Spring</td><td>Fall</td></tr>
<tr><td>Dry Prairie (Reclamation)</td><td>71</td><td>76</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Dry Prairie (Enhancement)</td><td>39</td><td>40</td><td>Yes (Yr.3)</td></tr>
<tr><td>Dry Prairie (Native Area)</td><td>30</td><td>36</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Pine Flatwoods (Reclamation)</td><td>51</td><td>49</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Pine Flatwoods (Enhancement)</td><td>27</td><td>25</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Pine Flatwoods (Native Area)</td><td>33</td><td>23</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Temperate Hardwoods (Reclamation)</td><td>23</td><td>22</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Temperate Hardwoods (Enhancement)</td><td>28</td><td>23</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Temperate Hardwoods (Native Area)</td><td>16</td><td>18</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Xeric Oak (Reclamation)</td><td>21</td><td>22</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Xeric Oak (Enhancement)</td><td>37</td><td>32</td><td>Yes (Yr. 3)</td></tr>
<tr><td>Xeric Oak (Native Area)</td><td>26</td><td>30</td><td>Yes (Yr. 3)</td></tr>
<tr><td rowspan="2">5. Wildlife Success Criteria for each RA are intended to be flexibly applied in light of certain factors including, but not limited to, future and adjacent land uses and inherent uncertainties involved in documenting wildlife species presence onsite:

a. Fishes: For connected wetlands combined (forested and freshwater marshes), a minimum of four forage species (prey base primarily plants and invertebrates), and one top carnivore species (eats other fish).</td><td colspan="3">Number of Fish Spp. Observed</td><td rowspan="2">NA</td></tr>
<tr><td colspan="3">Site consists of uplands only</td></tr>
</table>

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Hillsborough County Phosphate Mining Reclamation Manual (2006) Volume 1.V.B. Release Criteria	Current Status of SUWH Site			Success Criteria Demonstrated
	Number of Amphibian Spp. Observed			
b. Amphibians: For upland plant communities combined, a minimum of three anurian species, as documented by occurrence in the uplands or at their breeding ponds (isolated wet prairies or freshwater marshes).		**Spring**	**Fall**	
	Three (3) Anurian Species:	0	2	No
	No. of Anurian Species Since Baseline:	6	5	Yes (Yr. 3)
For connected wetlands combined (forested and freshwater wetlands), a minimum of three anuran species and one salamander species.	Site Consists of Uplands Only	NA	NA	NA
	Number of Avian Spp. Observed			
		Spring	**Fall**	
c. Birds: For upland plant communities combined, a minimum of 20 total resident species represented by at least three birds of prey species (Falconiformes or Strigiformes); one dove species (Columbiformes); one woodpecker species (Piciformes); and 10 songbird species (Passeriformes) represented by at least one member of the following families: Emberizidae, Hirundinidae, Icteridae, Mimidae, Troglodytidae, Trannidae, and Vireonidae; and at least two members of the Parulidae family.	Twenty (20) Total Resident Species:	21	38	Yes (Yr. 3)
	Total Resident Species Since Baseline:	63	66	Yes (Yr. 3)
	Three (3) Birds of Prey Species:	3	3	Yes (Yr. 3)
	One (1) Dove Species:	2	2	Yes (Yr. 3)
	One (1) Woodpecker Species:	1	2	Yes (Yr. 3)
	<u>Songbird Species</u>			
	One (1) member of Emberizidae:	1	1	Yes (Yr.3)
	One (1) member of Hirundinidae:	0	2	Yes (Yr. 3)
	One (1) member of Icteridae:	1	2	Yes (Yr. 3)
	One (1) member of Mimidae:	2	2	Yes (Yr. 3)
	One (1) member of Troglodytidae:	1	2	Yes (Yr. 3)
	One (1) member of Trannidae:	0	1	Yes (Yr. 3)
	One (1) member of Vireonidae:	1	1	Yes (Yr. 3)
	One (1) member of Parulidae:	2	3	Yes (Yr. 3)
For wetland plant communities combined, a total of 18 total resident species represented by at least two waterfowl species (Anseriformes or Podicipediformes), one shorebird species (Charadriiformes), four wading birds species (Ciconiformes), one member of cranes and their allies (Guiformes), two bird of prey species (Falconiformes or Strigiformes) and four songbird species (Passeriformes) from at least two families.	Ten (10) Total Songbird Species:	10	21	Yes (Yr. 3)
	Site Consists of Uplands Only	NA	NA	NA

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Hillsborough County Phosphate Mining Reclamation Manual (2006) Volume 1.V.B. Release Criteria	Current Status of SUWH Site			Success Criteria Demonstrated
d. Reptiles: For upland plant communities combined, a minimum of two lizard species, one herbivorous turtle species, and three snake species with a total reptilian diversity of at least seven species. For wetland plant communities, a minimum of two turtle species (represented by at least one herbivore and one carnivore) and two snake species with a minimum reptilian diversity of at least five species.	**Number of Reptilian Spp. Observed**			
		Spring	**Fall**	
	Two (2) Lizard Species:	3	1	No
	One (1) Turtle Species:	1	1	Yes (Yr. 3)
	Three (3) Snake Species:	0	2	No
	Seven (7) Total Species:	4	4	No
	Total Reptilian Sp. Since Baseline:	9	9	Yes (Yr. 3)
	Site Consists of Uplands Only	NA	NA	NA
e. Mammals: For upland plant communities combined, a minimum of eight total species represented by at least three small mammal species (Insectivora or Rodentia), one rabbit species (Lagomorpha), the opossum (Marsupiala), and two carnivore species (Carnivora). For wetland plant communities combined, a minimum of five total species represented by at least one small mammal species (Rodentia), one rabbit species (Lagomorpha), and two carnivore species (Carnivora).	**Number of Mammalian Spp. Observed**			
		Spring	**Fall**	
	Eight (8) Total Species:	3	8	Yes (Yr. 2)
	Total Mammalian Sp. Since Baseline:	9	12	Yes (Yr. 3)
	Three (3) Small Species:	1	1	No
	One (1) Rabbit Species:	0	1	Yes (Yr. 3)
	Opossum:	0	1	Yes (Yr. 3)
	Two (2) Carnivore Species:	1	2	Yes (Yr. 3)
	Site Consists of Uplands Only	NA	NA	NA

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Hillsborough County Phosphate Mining Reclamation Manual (2006) Volume 1.V.C.1 Management Guidelines	Current Status of SUWH Site			Success Criteria Demonstrated
Category 1 and 2 nuisance exotic species (as defined by the Florida Exotic Pest Plant Council (FLEPPC), most recent available list) abundance shall not exceed 10 percent aggregate areal coverage at any time in any RA, or within any individual plant community. The following species listed in Subsection C.1 of Section V must be managed so that areal coverage does not exceed 10 percent areal coverage within an RA or within any individual plant community at any time: Australian pine (*Casuarina spp.*), bermudagrass (*Cynodon dactylon*), air potato (*Dioscorea bulbifera*), water-hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), cogongrass (*Imperata spp.*), climbing fern (*Lygodium spp.*), skunkvine (*Paederia foetida*), bahiagrass (*Paspalum notatum*) – except for erosion control as referenced, (downy rose myrtle (*Rhodomyrtus tomentosa*), Chinese tallowtree (*Sapium sebiferum*), Brazilian peppertree (*Schinus terebinthifolius*), tropical soda apple (*Solanum viarum)*, punk tree (*Melaleuca quinquenervia*), rose natal grass (*Rhynchelytrum repens*)	**Nuisance Species Cover**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Dry Prairie (Reclamation)	12.5%	24.7%	No
	Dry Prairie (Enhancement)	25.9%	41.2%	No
	Dry Prairie (Native Area)	1.8%	6.8%	Yes (Yr. 2)
	Pine Flatwoods (Reclamation)	22.7%	13.9%	No
	Pine Flatwoods (Enhancement)	28.5%	20.3%	No
	Pine Flatwoods (Native Area)	0.0%	0.0%	Yes (Yr. 3)
	Temperate Hardwoods (Reclamation)	12.0%	30.2%	No
	Temperate Hardwoods (Enhancement)	1.8%	8.0%	Yes (Yr.3)
	Temperate Hardwoods (Native Area)	27.4%	15.7%	No
	Xeric Oak (Reclamation)	5.9%	42.7%	No
	Xeric Oak (Enhancement)	0.0%	4.0%	Yes (Yr.3)
	Xeric Oak (Native Area)	0.0%	0.4%	Yes (Yr. 3)

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Hillsborough County Phosphate Mining Reclamation Manual (2006) Table 5. Number/Areal Coverage Requirements	Current Status of SUWH Site			Success Criteria Demonstrated
For Dry Prairies				
Total groundcover must be greater than or equal to 50% and have a minimum of 30 groundcover species consistent of appropriate Dry Prairie plant communities.	**Total Groundcover ≥50% / ≥30 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Dry Prairie (Reclamation):	70.4% / 60	88.4% / 64	Yes (Yr. 3)
	Dry Prairie (Enhancement):	87.0% / 20	86.6% / 27	Yes (Yr. 2)*
	Dry Prairie (Native Area):	76.6% / 48	68.3% / 56	Yes (Yr. 3)
	*Effectively meeting			
Total canopy cover must be less than 5%.	**<5% Canopy Cover**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Dry Prairie (Reclamation):	6.7%	4.9%	Yes (Yr. 2)*
	Dry Prairie (Enhancement):	202.9%	83.1%	No
	Dry Prairie (Native Area):	0.4%	0.6%	Yes (Yr. 2)
	*Effectively meeting			
Total shrubs per acre must be greater than or equal to 20 shrubs per acre (shrubs/acre) and consist of a minimum of five appropriate dry prairie shrub species.	**≥20 Shrubs Per Acre (Density) / ≥5 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Dry Prairie (Reclamation):	103 / 5	38 / 3	Yes (Yr. 1)
	Dry Prairie (Enhancement):	67 / 1	40 / 1	No
	Dry Prairie (Native Area):	796 / 8	1668 / 8	Yes (Yr. 1)

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FOUR CORNERS MINE
ANNUAL MONITORING REPORT
JUNE 2024 (SPRING)
OCTOBER - NOVEMBER 2024 (FALL)
SIGNIFICANT UPLAND WILDLIFE MONITORING
MUs 15E, 16E, 17E, AND 19E
2006 HILLSBOROUGH COUNTY PHOSPHATE MINING RECLAMATION MANUAL
HILLSBOROUGH COUNTY, FLORIDA

EXECUTIVE SUMMARY (Continued)

Hillsborough County Phosphate Mining Reclamation Manual (2006) Table 5. Number/Areal Coverage Requirements	Current Status of SUWH Site			Success Criteria Demonstrated
For Pine Flatwoods				
Total mesic groundcover species must be greater than or equal to 50% total cover and xeric groundcover species must be greater than or equal to 35%. A minimum of 30 groundcover species consistent of appropriate Pine Flatwoods plant communities must be present.	**≥50% Mesic Groundcover / ≥35% Xeric Groundcover / ≥30 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Pine Flatwoods (Reclamation):	23.2% / 39.2% / 57	33.7% / 34.5% / 62	No
	Pine Flatwoods (Enhancement):	51.2% / 31.8% / 40	47.6% / 32.9% / 42	Yes (Yr. 1)*
	Pine Flatwoods (Native Area):	65.9% / 24.5% / 30	39.4% / 24.3% / 42	No
	*Effectively meeting			
Total canopy cover must be 10% and have between 15-100 Trees Per Acre (trees/acre). A minimum of 3-4 appropriate Pine Flatwoods tree species must be present.	**10% Total Canopy Cover / 15-100 Trees Per Acre (Density) / ≥3-5 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Pine Flatwoods (Reclamation):	56.8% / 182 / 5	20.4% / 88 / 4	No
	Pine Flatwoods (Enhancement):	44.4% / 226 / 3	29.6% / 387 / 3	No
	Pine Flatwoods (Native Area):	57.4% / 370 / 4	84.6% / 160 / 3	No
Total shrubs per acre must be greater than or equal to 100 shrubs per acre (shrubs/acre) and have a minimum of 5-8 appropriate Pine Flatwoods shrub species.	**≥100 Shrubs Per Acre (Density) / ≥5-8 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Pine Flatwoods (Reclamation):	56 / 3	104 / 2	No
	Pine Flatwoods (Enhancement):	0 / 0	27 / 1	No
	Pine Flatwoods (Native Area):	1,226 / 5	860 / 3	Yes (Yr. 2)

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EXECUTIVE SUMMARY (Continued)

Hillsborough County Phosphate Mining Reclamation Manual (2006) Table 5. Number/Areal Coverage Requirements	Current Status of SUWH Site			Success Criteria Demonstrated
For Temperate Hardwoods				
Total groundcover must be greater than or equal to 50% and have a minimum of 20 groundcover species consistent of appropriate Temperate Hardwoods plant communities.	**≥50% Total Groundcover / ≥20 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Temperate Hardwoods (Reclamation):	78.6% / 25	91.0% / 12	Yes (Yr. 3)
	Temperate Hardwoods (Enhancement):	39.4% / 33	65.2% / 24	Yes (Yr. 2)
	Temperate Hardwoods (Native Area):	56.3% / 25	44.7% / 27	Yes (Yr. 2)
Total canopy cover must be 30% and have greater than or equal to 200 Trees Per Acre (trees/acre) and have a minimum of 8-10 appropriate Temperate Hardwoods tree species present.	**30% Canopy Cover / ≥200 Trees Per Acre (Density) / 8-10 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Temperate Hardwoods (Reclamation):	31.4% / 184 / 4	13.2% / 98 / 3	No
	Temperate Hardwoods (Enhancement):	90.8% / 639 / 6	89.8% / 280 / 6	No
	Temperate Hardwoods (Native Area):	145.7% / 220 / 3	53.3% / 260 / 3	No
Total shrubs per acre must be greater than or equal to 50 shrubs per acre (shrubs/acre) and consist of a minimum of 5-8 appropriate Temperate Hardwoods shrub species.	**≥50 Shrubs Per Acre (Density) / 5-8 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Temperate Hardwoods (Reclamation):	11 / 1	52 / 2	No
	Temperate Hardwoods (Enhancement):	13 / 1	40 / 1	No
	Temperate Hardwoods (Native Area):	520 / 2	450 / 3	No

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EXECUTIVE SUMMARY (Continued)

Hillsborough County Phosphate Mining Reclamation Manual (2006) Table 5. Number/Areal Coverage Requirements	Current Status of SUWH Site			Success Criteria Demonstrated
For Xeric Oak				
Total groundcover must be greater than or equal to 35% and have a minimum of 30 groundcover species consistent of appropriate Xeric Oak plant communities present.	**≥35% Total Groundcover / ≥30 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Xeric Oak (Reclamation):	64.7% / 21	87.4% / 25	No
	Xeric Oak (Enhancement):	39.5% / 21	34.9% / 22	No
	Xeric Oak (Native Area):	54.8% / 21	32.2% / 22	No
Total shrubs per acre must be greater than or equal to 200 shrubs per acre (shrubs/acre) and have a minimum of 5-8 appropriate Xeric Oak shrub species.	**≥200 Shrubs Per Acre (Density) / 5-8 HCPMRM Listed Species**			
	Land Use (Land Status)	**Spring**	**Fall**	
	Xeric Oak (Reclamation):	370 / 4	550 / 2	Yes (Yr. 1)*
	Xeric Oak (Enhancement):	414 / 3	307 / 1	No
	Xeric Oak (Native Area):	973 / 3	520 / 2	No
	*Effectively meeting			

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1.0 INTRODUCTION

This report represents the results for the 2024 biannual monitoring surveys at the Four Corners Mine, Significant Upland Wildlife Habitat (SUWH), Mining Units 15E, 16E, 17E, and 19E. The Four Corners Mine SUWH is located in Sections 13-15, 19, 22-28, 30, 33-36, Township 32 South, Range 21 and 22 East, Hillsborough County, Florida (Figures 1 and 1A). Monitoring was conducted according to the methodologies outlined within the Hillsborough County Phosphate Mining Reclamation Manual (HCPMRM). The following table summarizes the SUWH areas that were monitored for this event:

Land Use	Land Status	Annual Event	Acreage
Dry Prairie	Reclamation	Fourth	946.4
Dry Prairie	Enhancement	Fourth	16.2
Dry Prairie	Native Area	Fourth	150.7
Pine Flatwoods	Reclamation	Fourth	310.2
Pine Flatwoods	Enhancement	Fourth	33.2
Pine Flatwoods	Native Area	Fourth	73.7
Temperate Hardwoods	Reclamation	Fourth	93.9
Temperate Hardwoods	Enhancement	Fourth	14.1
Temperate Hardwoods	Native Area	Fourth	63.0
Xeric Oak	Reclamation	Fourth	62.2
Xeric Oak	Enhancement	Fourth	20.8
Xeric Oak	Native Area	Fourth	21.4
Total			**1805.8**

2.0 CONSTRUCTION SUMMARY

Mining occurred in mid-2000's and the area was contoured to the final grade consistent with a Dry Prairie, Pine flatwoods, Temperate Hardwoods, and Xeric Oak community types. Topsoil consisting of native soils and vegetation material for reclamation areas were spread at depths ranging from 6-12 inches. Between 2004 and 2012, seeding occurred on previously mined soils consisting of sand tailings and overburden. A detailed planting list is provided in Appendix A.

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3.0 RELEASE CRITERIA

Volume 1.V.B.
Per Volume 1.V.B. of the Hillsborough County Phosphate Mining Reclamation Manual (HCPMRM): For Reclamation Areas (RA) to be considered successful and released from further monitoring or reclamation obligations, the following criteria shall be met:

1. Natural plant communities mitigating mapped significant upland habitat must have the species, areal coverage/projected areal coverage, quantities, and diversity of trees, shrubs, and ground cover consistent with Tables 2, 3, 4, and 5 as appropriate unless other plant lists and/or success criteria are otherwise specified as conditions of approval of the mining unit.

2. The landward extent and areas water ward of the proposed limits for RA wetlands must also meet criteria as described in Chapter 62-340, F.A.C. inclusive of vegetation and evidence of hydrology or hydric soil characteristics.

3. Documentation of the species from each stratum, exclusive of nuisance species, with viable seed set for each of the natural plant communities. Seedlings, saplings, or other 'young' vegetation may be considered proof of flowering and/or viable seed.

4. Table 6 provides a list of native vertebrate species known or suspected to occur in HC. These vertebrates form the pool from which representative species can be sampled to evaluate the success of the rehabilitation area. Table 6 includes both the permanent native resident fauna and migratory birds, which depend heavily on the Florida landscape for their survival and are an important component of the consumer food web. Each RA will be evaluated separately unless connected by a wildlife corridor (exclusive of avifauna corridors). Success criteria will only use those vertebrate species appropriate for the plant communities contained within each RA i.e., fish criteria will not be used if the RA consists of only upland plant communities.

5. Wildlife Success Criteria for each RA are intended to be flexibly applied in light of certain factors including, but not limited to, future and adjacent land uses and inherent uncertainties involved in documenting wildlife species presence onsite:

a. Fishes: For connected wetlands combined (forested and freshwater marshes), a minimum of four forage species (prey base primarily plants and invertebrates), and one top carnivore species (eats other fish).

b. Amphibians: For upland plant communities combined, a minimum of three anurian species, as documented by occurrence in the uplands or at their breeding ponds (isolated wet prairies or freshwater marshes). For connected wetlands combined (forested and freshwater wetlands), a minimum of three anuran species and one salamander species.

c. Birds: For upland plant communities combined, a minimum of 20 total resident species represented by at least three birds of prey species (Falconiformes or Strigiformes); one dove species (Columbiformes); one woodpecker species (Piciformes); and 10 song bird species (Passeriformes) represented by at least one member of the following families:

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Emberizidae, Hirundinidae, Icteridae, Mimidae, Troglodytidae, Trannidae, and Vireonidae; and at least two members of the Parulidae family.

For wetland plant communities combined, a total of 18 total resident species represented by at least two waterfowl species (Anseriformes or Podicipediformes), one shorebird species (Charadriiformes), four wading birds species (Ciconiformes), one member of cranes and their allies (Guiformes), two bird of prey species (Falconiformes or Strigiformes) and four songbird species (Passeriformes) from at least two families.

d. Reptiles: For upland plant communities combined, a minimum of two lizard species, one herbivorous turtle species, and three snake species with a total reptilian diversity of at least seven species. For wetland plant communities, a minimum of two turtle species (represented by at least one herbivore and one carnivore) and two snake species with a minimum reptilian diversity of at least five species.

e. Mammals: For upland plant communities combined, a minimum of eight total species represented by at least three small mammal species (Insectivora or Rodentia), one rabbit species (Lagomorpha), the opossum (Marsupiala), and two carnivore species (Carnivora). For wetland plant communities combined, a minimum of five total species represented by at least one small mammal species (Rodentia), one rabbit species (Lagomorpha), and two carnivore species (Carnivora).

Volume 1.V.C.1

Category 1 and 2 nuisance exotic species (as defined by the Florida Invasive Species Council (FISC), most recent available list (2023)) abundance shall not exceed 10 percent aggregate areal coverage at any time in any RA, or within any individual plant community.

The following species listed in Section V.C.1 must be managed so that areal coverage does not exceed 10 percent areal coverage within an RA or within any individual plant community at any time: Australian pine (*Casuarina spp.*), bermudagrass (*Cynodon dactylon*), air potato (*Dioscorea bulbifera*), water-hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), cogongrass (*Imperata spp.*), climbing fern (*Lygodium spp.*), skunkvine (*Paederia foetida*), bahiagrass (*Paspalum notatum*) – except for erosion control as referenced, (downy rose myrtle (*Rhodomyrtus tomentosa*), Chinese tallowtree (*Sapium sebiferum*), Brazilian peppertree (*Schinus terebinthifolius*), tropical soda apple (*Solanum viarum)*, punk tree (*Melaleuca quinquenervia*), rose natal grass (*Rhynchelytrum repens*).

HCPMRM (2006) Table 5. Number/areal coverage requirements

Plant Community	**Strata**		
	Ground Cover & Vines	**Canopy** **Trees/acre avg.**	**Shrub** **Shrubs/acre avg.**
Dry Prairie	≥ 50 (30 spp.)	< 5% total cover	≥ 20 shrubs (5 spp.)
Pine Flatwoods	≥ 50 mesic, ≥ 35 scrubby (30 spp.)	15 – 100 (3-4 spp.) 10% closure	≥ 100 shrubs (5-8 spp.)
Temperate Hardwoods	≥ 50 (20 spp.)	≥ 200 (8-10 spp.) 30% closure	≥ 50 shrubs (5-8 spp.)
Xeric Oak Hammock	≥ 35 (30 spp.)	NA	≥ 200 shrubs (5-8 spp.)

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4.0 METHODOLOGY

Vegetative sampling was conducted along 120 randomized monitoring points each containing one, 10 meters x 10 meters transect. Monitoring results were reported by land use per Florida Land Use Cover and Forms Classification System (FLUCFCS) and land status (reclamation, enhancement, or native area). The data was entered directly into an iPad mini and downloaded onto a computer for analysis.

Taxonomy and nomenclature of species followed Wunderlin and Hansen (2011). Plant species have been assigned to a natural plant community if listed on the HCPMRM Tables 2, 3, and 4. Species indicator status was assigned pursuant to Section 62-340, Florida Administrative Code (F.A.C.). As per success criteria, species were classified as *nuisance* according to both the Florida Invasive Species Council's List of Invasive Species- Category I and II (FISC, 2023) and the Noxious Weed List per Chapter 5B-57.007, (F.A.C.). Species were classified as non-native according to those listed as non-native by The Atlas of Florida Vascular Plants (Wunderlin and Hansen, 2024).

4.1 Photographic Documentation

Photographic documentation was conducted at fourteen (14) permanent photo stations at fixed locations within the SUWH (Figure 2). These stations were made from 8-foot tall, galvanized signpost with the top exactly five feet from the ground and include a L shape sign blank bolted to the top and used as a holder/shelf for the camera to rest upon. Photographs were taken in four cardinal directions (North, East, South, & West). The land use, transect status, and compass direction were recorded for each photograph.

4.2 Tree Sampling

Transects were established at randomly generated points provided by Mosaic and consisted of 10 meters long by 10 meters wide belt format. All transects where aligned north to south, with the mid-point of the transect occurring at a randomly generated monitoring point.

Belt transects were utilized to calculate tree and shrub densities within the 10 meters by 10 meters transect. Trees and shrubs located within each transect were marked for identification and monitored to calculate density and condition. Tree seedlings were also noted but were not included in the tree density calculations.

Land Use (Land Status)	Number of Transects	Acreage (ac)
Dry Prairie (Reclamation)	56	1.400
Dry Prairie (Enhancement)	3	0.075
Dry Prairie (Native Area)	10	0.250
Pine Flatwoods (Reclamation)	20	0.500
Pine Flatwoods (Enhancement)	3	0.075
Pine Flatwoods (Native Area)	4	0.100
Temperate Hardwoods (Reclamation)	7	0.175
Temperate Hardwoods (Enhancement)	3	0.075
Temperate Hardwoods (Native Area)	4	0.100

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Land Use (Land Status)	Number of Transects	Acreage (ac)
Xeric Oak (Reclamation)	4	0.100
Xeric Oak (Enhancement)	3	0.075
Xeric Oak (Native Area)	3	0.075

Tree/shrub density was determined with the following formula:

$$\textit{Tree/shrub Density (trees/shrubs per acre)} = \frac{\textit{Number of Individuals in all transects}}{\textit{Total Area of all transects}}$$

Belt transects were utilized to calculate the canopy cover except when transects were within xeric oak plant communities. Canopy spread was taken in centimeters and the following formula was used to estimate canopy cover (cm^2) for each tree.

$$\textit{Canopy Cover X} = \pi r^2$$

Where: X is the sample tree, π equals 3.14159, and r is the radius (1/2 the diameter).

The following formula is used to calculate total percent canopy cover.

$$\textit{Percent Canopy Cover} = \frac{\sum \textit{ of all tree canopy measurements x 100}}{\textit{Total sample area}}$$

Additional tree species observed outside the designated transects were identified and recorded if rooted within the boundaries of the SUWH area; however, these were not included in tree density calculations.

4.3 Herbaceous Sampling

Groundcover consisted of herbaceous species less than eighteen (18) inches in height. Herbaceous inventory quadrats ($1m^2$) were established adjacent to and outside of the monitoring transect (i.e.: 5-meters distance from the monitoring point) in each cardinal direction. Monitoring results were reported by land use (per FLUCFCS) and land status (reclamation, enhancement, or native area). The data was entered directly into an iPad mini and downloaded onto a computer for analysis.

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Land Use	Land Status	No. of Transects	No. of Quadrats
Dry Prairie	Reclamation	56	224
	Enhancement	3	12
	Native Area	10	40
Pine Flatwoods	Reclamation	20	80
	Enhancement	3	12
	Native Area	4	16
Temperate Hardwoods	Reclamation	7	28
	Enhancement	3	12
	Native Area	4	16
Xeric Oak	Reclamation	4	16
	Enhancement	3	12
	Native Area	3	12
Totals		**120**	**480**

Data for all quadrats were combined to determine the average percent cover of listed species, native non-listed species, non-native species, nuisance species, and bare ground/dead litter.

Herbaceous cover of each species was determined with the following formula:

$$\textit{Relative Percent Cover} = \frac{\textit{Total Relative Cover of Species A}}{\textit{Total \# of Quadrats in Sample Area}}$$

Average percent cover of all herbaceous species was determined with the following formula:

$$\textit{Total Estimated \% Cover of X} = \frac{\textit{Total Estimated Cover of X in all Quadrats in that Land Use}}{\textit{Total \# Quadrats in that Land Use}}$$

Additional shrub and herbaceous species observed outside of the designated sampling quadrats were identified and recorded as additional species if rooted within the boundaries of the SUWH area.

4.4 Wildlife Utilization

Wildlife species were observed and reported by land use (per FLUCFCS) and land status (Mitigation/Conservation) during the monitoring events. Evidence of wildlife including tracks, calls, and scat were also recorded. Wildlife tables will be cumulative over time per land use and land status and evaluated against success criteria.

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5.0 RESULTS

The 2024 quantitative monitoring surveys were conducted on June 20th, 25th, and 27th and October 28th-31st and November 1st by Kleinfelder ecologists Zach Conger, Riley Lund, Edward Murawski, and Ben Pardue. Average temperature during the spring monitoring event was 90 degrees (°Fahrenheit) with a max temperature of 97 degree (°Fahrenheit). Conditions ranged from sunny and clear to partly cloudy and rainy. Average temperature during the fall monitoring event was 71 degrees (°Fahrenheit) with max temperature of 82 degrees (°Fahrenheit). Conditions ranged from clear skies and sunny to cloudy and rainy.

5.1 Photographic Documentation

Photographic documentation was conducted at fourteen (14) permanent photo stations at fixed locations within the SUWH (Figure 2). Photographs of each monitoring event are included in Appendix B.

5.2 Spring Monitoring Event

5.2.1 Dry Prairie (Reclamation)

Trees

Four tree species were recorded within the belt transects for a total density of 51 trees per acre (Table 1). Three of the four tree species were listed in the HCPMRM for a total density of 50 trees per acre. The dominant species was wax myrtle (*Myrica cerifera*) with a density of 27 trees per acre. Total canopy cover accounted for 6.7% of habitat. Two trees showed signs of stress (2.8% of all trees) at the time of the monitoring event. Six dead trees were recorded, and no tree seedlings were observed during the monitoring event. One additional tree species, cabbage palm (*Sabal palmetto*) was observed outside of the belt transects but not included in the density calculations.

Shrubs

Five shrub species, all listed in the HCPMRM, were documented within the belt transect for a total density of 103 shrubs per acre (Table 1). The dominant shrub species was saw palmetto (*Serenoa repens*) with a density of 69 shrubs per acre. Three additional shrub species, running oak (*Quercus pumila*), round-pod St. John's wort (*Hypericum cistifolium*),and winged sumac (*Rhus copallinum*) were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation

Ninety-six herbaceous species were recorded within the Dry Prairie (Reclamation) plant community for a total cover of 70.4%, which included 32.9% cover by species listed in the HCPMRM, 12.6% cover by other native species not listed in the HCPMRM, 12.4% cover by non-native species, and 12.5% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 31.2% of total cover (Table 2).

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The most abundant species was natalgrass (*Melinis repens*) with 6.7% cover. Subdominant species included smutgrass (*Sporobolus indicus*; 6.6%) and broomsedge (*Andropogon virginicus*; 6.1%) (Table 3). Forty-four additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 4). A total of sixty species listed in the HCPMRM were observed. Thirty-two HCPMRM listed species were observed reproducing naturally within the SUWH (Tables 3 and 4).

Twelve nuisance species were recorded within the Dry Prairie (Reclamation) plant community for a total cover of 12.5% (Table 3). The most abundant nuisance species was natalgrass with 6.7% cover.

5.2.2 Dry Prairie (Enhancement)

Trees
Five tree species were recorded within the belt transects for a total density of 733 trees per acre (Table 5). Two of the five tree species were listed in the HCPMRM for a total density of 80 trees per acre. The dominant species was live oak (*Quercus virginiana*) with a density of 67 trees per acre. Total canopy cover accounted for 202.9% of habitat. No trees showed signs of stress, no tree seedlings were observed, and no dead trees were recorded at the time of the monitoring event. Two additional tree species was observed outside of the belt transects but not included in the density calculations.

Shrubs
Two shrub species were documented within the belt transect for a total density of 67 shrubs per acre (Table 5). One of the two shrub species, eastern false-willow (*Baccharis halimifolia*), was listed in the HCPMRM for a total density of 27 shrubs per acre. The dominant shrub species was St. Andrews cross (*Hypericum hypericoides*), with a density of 40 shrubs per acre. Two additional shrub species, saw palmetto and American beauty-berry (*Callicarpa americana*) were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Thirty herbaceous species were recorded within the Dry Prairie (Enhancement) plant community for a total cover of 87.0%, which included 37.7% cover by species listed in the HCPMRM, 18.6% cover by other native species not listed in the HCPMRM, 4.8% cover by non-native species, and 25.9% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 13.0% of total cover (Table 2).

The most abundant species was caesarweed (*Urena lobata*) with 22.0% cover. Subdominant species included licorice weed (*Scoparia dulcis*; 10.8%), broomsedge (10.6%), and water oak (*Quercus nigra*; 5.5%) (Table 6). Twenty additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 7). A total of twenty species listed in the HCPMRM were observed during

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the current monitoring event. Fourteen HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 6 and 7).

Three nuisance species were recorded within the Dry Prairie (Enhancement) plant community for a total cover of 25.9% (Table 6). The most abundant nuisance species was caesarweed with 22.0% cover.

5.2.3 Dry Prairie (Native Area)

Trees
Four tree species were recorded within the belt transects for a total density of 28 trees per acre (Table 8). One of the four tree species, live oak, was listed in the HCPMRM for a total density of four trees per acre (Table 8). Total canopy cover accounted for 0.4% of habitat. No tree showed signs of stress at the time of the monitoring event, no tree seedlings were observed, and no dead trees were recorded. No additional tree species were observed outside of the belt transects.

Shrubs
Nine shrub species were documented within the belt transect for a total density of 796 shrubs per acre (Table 8). Eight of the nine shrub species was listed in the HCPMRM for a total density of 672 shrubs per acre. The dominant shrub species was saw palmetto with a density of 588 shrubs per acre. Three additional shrub species, St. John's wort (*Hypericum tetrapetalum*), American beauty-berry, and round-pod St. John's wort, were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Fifty-two herbaceous species were recorded within the Dry Prairie (Native Area) plant community for a total cover of 76.6%, which included 66.5% cover by species listed in the HCPMRM, 8.0% cover by other native species not listed in the HCPMRM, 0.3% cover by non-native species, and 1.8% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 24.3% of total cover (Table 2).

The dominant species was saw palmetto with 20.7% cover. Subdominant species included slender goldenrod (*Euthamia caroliniana*; 7.1%), wire grass (*Aristida stricta*; 6.5%), and milkpea (*Galactia elliotii*; 6.0%) (Table 9). Twenty-five additional species were encountered within the Native Area plant community, but outside the sampling area (Table 10). A total of 47 species listed in the HCPMRM were observed. Twenty-two HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 9 and 10).

Two nuisance species were recorded within the Dry Prairie (Native Area) plant community for a total cover of 1.8% (Table 9). The most abundant nuisance species was cogon grass (*Imperata cylindrica*) with 1.0% cover.

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5.2.4 Pine Flatwoods (Reclamation)

Trees
Six tree species were recorded within the belt transects for a total density of 182 trees per acre. Five of the six tree species were listed in the HCPMRM for a density of 178 trees per acre (Table 11). The dominant species was slash pine (*Pinus elliottii*) with a density of 108 trees per acre. Total canopy cover accounted for 56.8% of habitat. Eight trees showed signs of stress (8.8% of all trees) at the time of the monitoring event. Eleven tree seedlings were observed, and seventeen dead trees were recorded, but not included in the density calculations. No additional tree species were observed outside of the belt transects.

Shrubs
Three shrub species, all of which are listed in the HCPMRM, were documented within the belt transect for a total density of 56 shrubs per acre (Table 11). The dominant shrub species was saw palmetto with a density of 46 shrubs per acre. Three additional shrub species, American beauty-berry, St. John's wort, and bigflower pawpaw (*Asimina obovata*), were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Eighty-eight herbaceous species were recorded within the Pine Flatwoods (Reclamation) plant community for a total cover of 74.5%, which included 25.4% cover by species listed in the HCPMRM, 13.7% cover by other native species not listed in the HCPMRM, 12.7% cover by non-native species, and 22.7% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 26.2% of total cover (Table 2).

The most abundant species was bahia grass (*Paspalum notatum*) with 11.7% cover. Subdominant species included dwarf horseweed (*Conyza canadensis*; 6.6%) (Table 12). Twenty-two additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 13). A total of fifty-seven species listed in the HCPMRM were observed. Thirty-eight HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 12 and 13).

Ten nuisance species were recorded within the Pine Flatwoods (Reclamation) plant community for a total cover of 22.7% (Table 12). The most abundant nuisance species was bahia grass with 11.7% cover.

5.2.5 Pine Flatwoods (Enhancement)

Trees
Three tree species, all of which were listed in the HCPMRM, were recorded within the belt transects for a total density of 226 trees per acre (Table 14). The dominant species was slash pine with a density of 173 trees per acre. Total canopy cover accounted for 44.4% of habitat. No listed trees showed signs of stress at the time of

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the monitoring event. No trees seedlings were observed, and one dead tree was recorded. Three additional tree species, red maple (*Acer rubrum*), sweetbay (*Magnolia virginiana*), and water oak, were observed outside of the belt transects but not included in the density calculations.

Shrubs
No shrub species were recorded within the randomized belt transects during this year's current monitoring event. Two additional shrub species, Walter's viburnum (*Viburnum obovatum*) and winged sumac were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Twenty-four herbaceous species were recorded within the Pine Flatwoods (Enhancement) plant community for a total cover of 83.0%, which included 47.3% cover by species listed in the HCPMRM, 5.3% cover by other native species not listed in the HCPMRM, 1.9% cover by non-native species, and 28.5% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 17.0% of total cover (Table 2).

The most abundant species was bahia grass with 27.1% cover. The subdominant species included broomsedge (10.1%), slender goldenrod (9.3%), and fasciculate beakrush (*Rhynchospora fascicularis*; 5.5%) (Table 15). Thirty-seven additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 16). A total of 40 species listed in the HCPMRM were observed. Twenty-one HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 15 and 16).

Two nuisance species were recorded within the Pine Flatwoods (Enhancement) plant community for a total cover of 28.5% (Table 15). The most abundant nuisance species was bahia grass with 27.1% cover.

5.2.6 Pine Flatwoods (Native Area)

Trees
Five tree species were recorded within the belt transects for a total density of 370 trees per acre (Table 17). Four of the five tree species were listed in the HCPMRM for a total density of 320 trees per acre. The dominant species was wax myrtle with a density of 260 trees per acre. Total canopy cover accounted for 57.4% of habitat. No tree species showed signs of stress at the time of the monitoring event. No trees seedlings, or dead trees were observed. No additional tree species were observed outside of the belt transects.

Shrubs
Seven shrub species were recorded within the belt transects for a total density of 1226 shrubs per acre. Five of the seven shrub species were listed in the HCPMRM for a total density of 885 shrubs per acre (Table 17). The dominant shrub species was

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deerberry (*Vaccinium stamineum*) with a density of 390 shrubs per acre. Two additional shrub species, St. John's wort and large seedbox ((*Ludwigia octovalvis*), were observed outside the belt transects but not included in the density calculations.

Herbaceous Vegetation
Twenty-two herbaceous species were recorded within the Pine Flatwoods (Native Area) plant community for a total cover of 90.4%, which included 74.5% cover by species listed in the HCPMRM, and 15.9% cover by other native species not listed in the HCPMRM. Bare ground and/or dead litter accounted for approximately 9.6% of total cover (Table 2).

The dominant species was broomsedge with 14.4% cover. The subdominant species included Virginia chain fern (*Woodwardia virginica*; 11.8%), pine-barren goldenrod (*Solidago fistulosa*; 11.6%), bushy bluestem (*Andropogon glomeratus*; 9.6%), yellow-eyed grass (*Xyris* sp.; 8.8%), deerberry (7.5%), muscadine grape (*Vitis rotundifolia*; 6.0%), and gallberry (*Ilex glabra*; 5.1%) (Table 18). Eighteen additional species were encountered within the Native Area plant community, but outside the sampling area (Table 19). A total of thirty species listed in the HCPMRM were observed. Nineteen HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 18 and 19).

No nuisance species were recorded within the Pine Flatwoods (Native Area) plant community (Table 18).

5.2.7 Temperate Hardwoods (Reclamation)

Trees
Five tree species were recorded within the belt transects for a total density of 184 trees per acre (Table 20). Four of the five tree species were listed in the HCPMRM for a total density of 178 trees per acre. The dominant species was wax myrtle with a density of 103 trees per acre. Total canopy cover accounted for 31.4% of habitat. Two trees showed signs of stress (6.3% of all trees) at the time of the monitoring event. No listed tree seedlings and two dead trees were observed. One additional tree species, red bay (*Persea borbonia*), was observed outside of the belt transects but not included in the density calculations.

Shrubs
One listed shrub species, saw palmetto, was documented within the belt transect for a total density of eleven shrubs per acre (Table 20). No additional shrub species were observed outside of the transects.

Herbaceous Vegetation
Forty-eight herbaceous species were recorded within the Temperate Hardwood (Reclamation) plant community for a total cover of 78.6%, which included 34.2% cover by species listed in the HCPMRM, 16.0% cover by other native species not listed in the HCPMRM, 16.4% cover by non-native species, and 12.0% cover by

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nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 21.8% of total cover (Table 2).

The dominant species was southern crabgrass (*Digitaria ciliaris*) with 9.6% cover. The subdominant species included milkpea (7.5%), broomsedge (6.2%), and false moneywort (*Alysicarpus ovalifolius*; 5.5%) (Table 21). Twenty-three additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 22). A total of twenty-five species listed in the HCPMRM were observed. Twelve HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 21 and 22).

Seven nuisance species were recorded within the Temperate Hardwood (Reclamation) plant community for a total cover of 12.0% (Table 21). The most abundant nuisance species was Caesarweed with 4.9% cover.

5.2.8 Temperate Hardwoods (Enhancement)

Trees
Eight tree species were recorded within the belt transects for a total density of 639 trees per acre (Table 23). Six of the eight tree species were listed in the HCPMRM for a total density of 599 trees per acre. The dominant species was sweetgum (*Liquidambar styraciflua*) with a density of 360 trees per acre. Total canopy cover accounted for 90.8% of habitat. No trees showed signs of stress at time of the monitoring event. No listed tree seedlings or dead trees were recorded. Two additional tree species, cabbage palm and dahoon holly (*Ilex cassine*), were observed outside of the belt transects but not included in the density calculations.

Shrubs
One listed shrub species, eastern false-willow, was documented within the belt transect for a total density of thirteen shrubs per acre (Table 23). Four additional shrub species, American beauty-berry, St. Andrews cross, Walter's viburnum, and round-pod St. John's wort were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Twenty herbaceous species were recorded within the Temperate Hardwoods (Enhancement) plant community for a total cover of 39.4%, which included 32.6% cover by species listed in the HCPMRM, 5.0% cover by other native species not listed in the HCPMRM, and 1.8% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 60.6% of total cover (Table 2).

The dominant species was saw greenbrier (*Smilax bona-nox*) with 11.1% cover. The subdominant species included yellow jasmine (*Gelsemium sempervirens*; 7.5%) (Table 24). Thirty-eight additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 25). A total of thirty-three

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species listed in the HCPMRM were observed. Nine HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 24 and 25).

Two nuisance species were recorded within the Temperate Hardwoods (Enhancement) plant community for a total cover of 1.8% (Table 24). The most abundant nuisance species was bahia grass with 1.1% cover.

5.2.9 Temperate Hardwoods (Native Area)

Trees
Five tree species were recorded within the belt transects for a total density of 220 trees per acre (Table 26). Three of the five trees were listed in the HCPMRM for a total density of 200 trees per acre. The dominant species was water oak with a density of 100 trees per acre. Total canopy cover accounted for 145.7% of habitat. No trees showed signs of stress at the time of the monitoring event. No tree seedlings were observed, and one dead tree was recorded but not included in the density calculations. Four additional tree species, red maple, live oak, cabbage palm, and swamp bay (*Persea palustris*), were observed outside of the belt transects but not included in the density calculations.

Shrubs
Four shrub species were recorded within the belt transects for a total density of 520 shrubs per acre (Table 26). Two of the four shrub species were listed in the HCPMRM for a total density of 380 shrubs per acre. One additional shrub species, American beauty-berry, was observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Eighteen herbaceous species were recorded within the Temperate Hardwoods (Native Area) plant community for a total cover of 56.3%, which included 23.4% cover by species listed in the HCPMRM, 5.5% cover by other native species not listed in the HCPMRM, and 27.4% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 43.7% of total cover (Table 2).

The most abundant species was cogon grass with 23.1% cover. The subdominant species was saw palmetto (13.3%) (Table 27). Thirty additional species were encountered within the Native Area plant community, but outside the sampling area (Table 28). A total of twenty-two species listed in the HCPMRM were observed. Six HCPMRM listed species was measured or observed reproducing naturally within the SUWH (Tables 27 and 28).

Three nuisance species were recorded within the Temperate Hardwood (Native Area) plant community for a total cover of 27.4% (Table 27). The most abundant nuisance species was cogon grass with 23.1% cover.

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5.2.10 Xeric Oak (Reclamation)

Trees
One listed tree species, sand live oak was recorded within the belt transects for a total density of 120 trees per acre (Table 29). One tree showed signs of stress (8.3% of all trees) at the time of the monitoring event. No tree seedlings were observed but not included in the density calculations and no dead trees was recorded. No additional tree species were observed outside of the belt transects.

Shrubs
Four shrub species, all of which were listed in the HCPMRM, were documented within the belt transect for a total density of 370 shrubs per acre (Table 29). The dominant shrub species was saw palmetto with a density of 230 shrubs per acre. Two additional shrub species, bigflower pawpaw and running oak, were observed outside the belt transects but not included in the density calculations.

Herbaceous Vegetation
Twenty-eight herbaceous species were recorded within the Xeric Oak (Reclamation) plant community for a total cover of 64.7%, which included 44.4% cover by species listed in the HCPMRM, 13.5% cover by other native species not listed in the HCPMRM, 0.9% cover by non-native species, and 5.9% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 35.3% of total cover (Table 2).

The dominant species was broomsedge with 13.2% cover. The subdominant species included slender goldenrod (6.4%), natalgrass (5.9%), and wiregrass (*Aristida stricta*; 5.5%) (Table 30). Nine additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 31). A total of twenty species listed in the HCPMRM were observed. Eight HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 30 and 31).

One nuisance species, natalgrass, was recorded within the Xeric Oak (Reclamation) plant community for a total cover of 5.9% (Table 30).

5.2.11 Xeric Oak (Enhancement)

Trees
One non-listed tree species, live oak, was recorded within the belt transects for a total density of 67 trees per acre (Table 32). No trees showed signs of stress at the time of the monitoring event. No tree seedlings were observed, and no dead trees were recorded. One additional tree species, slash pine, was observed outside of the belt transects but not included in the density calculations.

Shrubs
Three shrub species, all of which are listed in the HCPMRM were documented within the belt transect for a total density of 414 shrubs per acre (Table 32). The dominant

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shrub species was saw palmetto with a density of 360 shrubs per acre. No additional shrub species were observed outside of the transects.

Herbaceous Vegetation
Twenty-one herbaceous species were recorded within the Xeric Oak (Enhancement) plant community for a total cover of 39.5%, which included 27.3% cover by species listed in the HCPMRM, and 12.2% cover by other native species not listed in the HCPMRM. Bare ground and/or dead litter accounted for approximately 60.5% of total cover (Table 2).

The dominant species was saw palmetto with 6.3% cover. The subdominant species was broomsedge (4.2%) (Table 33). Eighteen additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 34). A total of twenty-one species listed in the HCPMRM were observed. Eight species listed in the HCPMRM were measured or observed reproducing naturally within the SUWH (Tables 33 and 34).

No nuisance species were recorded within the Xeric Oak (Enhancement) plant community (Table 33).

5.2.12 Xeric Oak (Native Area)

Trees
One listed tree species, sand live oak, was recorded within the belt transects for a total density of 293 trees per acre (Table 35). No listed trees showed signs of stress at the time of the monitoring event. No listed trees seedlings were observed, and no dead trees were recorded. No additional tree species were observed outside of the belt transects.

Shrubs
Three shrub species, all of which are listed in the HCPMRM, were documented within the belt transect for a total density of 973 shrubs per acre (Table 35). The dominant shrub species was saw palmetto with a density of 920 shrubs per acre. Three additional shrub species, American beauty-berry, St. John's wort, and highbush blueberry (*Vaccinium corymbosum*) were observed outside of the transects but not included in the density calculations.

Herbaceous Vegetation
Twenty-one herbaceous species were recorded within the Xeric Oak (Native Area) plant community for a total cover of 54.8%, which included 42.3% cover by species listed in the HCPMRM, 10.4% cover by other native species not listed in the HCPMRM, and 2.1% cover by non-native herbaceous species. Bare ground and/or dead litter accounted for approximately 45.2% of total cover (Table 2).

The dominant species was saw palmetto with 9.3% cover. The subdominant species included wiregrass (7.2%), pinebarren three-awn (*Aristida spiciformis*; 5.9%), and

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sand live oak (5.4%) (Table 36). Nine additional species were encountered within the Native Area plant community, but outside the sampling area (Table 37). Twenty-one species listed in the HCPMRM were observed. Eight HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 36 and 37).

No nuisance species were recorded within the Xeric Oak (Native Area) plant community (Table 36).

5.2.13 Wildlife Utilization (Spring)

Dry Prairie (Reclamation)
Seventy-eight wildlife species have been observed since the baseline monitoring event, including fifty-seven avian species, fifty-four of which are listed in manual, eight reptilian species, seven of which are listed in manual, four amphibian species, all of which are listed in manual, and nine mammalian species, seven of which are listed in manual (Table 50). Seventeen wildlife species were observed during the spring monitoring event, two of which were observed for the first time. Of the seventy-eight species observed sense baseline monitoring, seventy-two are native vertebrates known or suspected to occur in Hillsborough County.

Dry Prairie (Enhancement)
Forty-three wildlife species have been observed since the baseline monitoring event, including twenty-nine avian species, twenty-eight of which are listed in manual, three reptilian species, two of which are listed in manual, three amphibian species, all of which are listed in manual, and eight mammalian species, six of which are listed in manual (Table 51). Five wildlife species were observed during the spring monitoring event, all of which were previously observed. Of the forty-three species observed sense baseline monitoring, thirty-nine are native vertebrates known or suspected to occur in Hillsborough County.

Dry Prairie (Native Area)
Thirty-three wildlife species have been observed since the baseline monitoring event, including twenty-three avian species, all of which are listed in manual, four reptilian species, three of which are listed in manual, one amphibian species, all of which are listed in manual, and five mammalian species, three of which are listed in manual (Table 52). Seven wildlife species were observed during the spring monitoring event, all of which were previously observed. Of the thirty-three species, thirty are native vertebrates known or suspected to occur in Hillsborough County.

Pine Flatwoods (Reclamation)
Fifty-five wildlife species have been observed since the baseline monitoring event, including thirty-nine avian species, thirty-eight of which are listed in manual, four reptilian species, three of which are listed in manual, two amphibian species, all of which are listed in manual, and ten mammalian species, eight of which are listed in manual (Table 53). Seven wildlife species were observed during the spring monitoring

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event, two of which were observed for the first time. Of the fifty-five species, fifty-one are native vertebrates known or suspected to occur in Hillsborough County.

Pine Flatwoods (Enhancement)
Thirty wildlife species have been observed since the baseline monitoring event, including twenty-one avian species, twenty of which are listed in manual, one reptilian species which is listed in manual, two amphibian species, all of which are listed in manual, and six mammalian species, four of which are listed in manual (Table 54). Three wildlife species were observed during the spring monitoring event, all of which were previously observed. Of the thirty species, twenty-seven are native vertebrates known or suspected to occur in Hillsborough County.

Pine Flatwoods (Native Area)
Thirty-six wildlife species have been observed since the baseline monitoring event, including twenty-eight avian species, all of which are listed in manual, three reptilian species, two of which are listed in manual, one amphibian species which is listed in manual, and four mammalian species, two of which are listed in manual (Table 55). Seven wildlife species were observed during the spring monitoring event, one of which was observed for the first time. Of the thirty-six species, thirty-three are native vertebrates known or suspected to occur in Hillsborough County.

Temperate Hardwoods (Reclamation)
Twenty-seven wildlife species have been observed since the baseline monitoring event, including twenty-one avian species, twenty of which are listed in manual, two reptilian species, one of which is listed in manual, and four mammalian species, two of which are listed in manual (Table 56). Three wildlife species were observed during the spring monitoring event, one of which was observed for the first time. Of the twenty-seven species, twenty-three are native vertebrates known or suspected to occur in Hillsborough County.

Temperate Hardwoods (Enhancement)
Thirty-two wildlife species have been observed since the baseline monitoring event, including twenty avian species, all of which are listed in manual, three reptilian species, two of which are listed in manual, three amphibian species, two of which are listed in manual, and six mammalian species, four of which are listed in manual (Table 57). Seven wildlife species were observed during the spring monitoring event, all of which were previously observed. Of the thirty-two species, twenty-eight are native vertebrates known or suspected to occur in Hillsborough County.

Temperate Hardwoods (Native Area)
Eighteen wildlife species have been observed since the baseline monitoring event, including ten avian species, all of which are listed in manual, four reptilian species, three of which are listed in manual, two amphibian species, all of which are listed in manual, and two mammalian species, one of which is listed in manual (Table 58). Two wildlife species were observed during the spring monitoring event, all of which

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were previously observed. Of the eighteen species, sixteen are native vertebrates known or suspected to occur in Hillsborough County.

Xeric Oak (Reclamation)
Twenty-five wildlife species have been observed since the baseline monitoring event, including seventeen avian species, sixteen of which are listed in manual, two reptilian species, one of which is listed in manual, one amphibian species which is listed in the manual, and five mammalian species, three of which is listed in manual (Table 59). Three wildlife species were observed during the spring monitoring event, two of which were observed for the first time. Of the twenty-five species, twenty-one are native vertebrates known or suspected to occur in Hillsborough County.

Xeric Oak (Enhancement)
Forty wildlife species have been observed since the baseline monitoring event, including twenty-seven avian species, all of which are listed in manual, five reptilian species, four of which are listed in manual, two amphibian species, all of which are listed in the manual, and six mammalian species, four of which are listed in manual (Table 60). Two wildlife species were observed during the spring monitoring event, one of which was observed for the first time. Of the forty species, thirty-seven are native vertebrates known or suspected to occur in Hillsborough County.

Xeric Oak (Native Area)
Twenty-nine wildlife species have been observed since the baseline monitoring event, including twenty-two avian species, twenty-one of which are listed in manual, two reptilian species, all of which are listed in manual, one amphibian species which is listed in the manual, and four mammalian species, two of which are listed in manual (Table 61). Two wildlife species were observed during the spring monitoring event, one of which was observed for the first time. Of the twenty-nine species, twenty-six are native vertebrates known or suspected to occur in Hillsborough County.

5.3 Fall Monitoring Event

5.3.1 Dry Prairie (Reclamation)

Trees
Eight tree species were recorded within the belt transects for a total density of 49 trees per acre (Table 62). Four of the eight trees were listed in the HCPMRM for a density of 33 trees per acre. The dominant species was wax myrtle with a density of 20 trees per acre. Total canopy cover accounted for 4.9% of habitat. Two trees showed signs of stress (2.9% of all trees) at the time of the monitoring event. No tree seedlings were observed, and eleven dead trees were recorded but not included in the density calculations. No additional tree species were observed outside of the belt transects.

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Shrubs
Three shrub species, all of which are listed in the HCPMRM, were documented within the belt transects for a total density of 38 shrubs per acre (Table 62). The dominant shrub species was saw palmetto with a density of 25 shrubs per acre. Three additional shrub species, coastplain staggerbush (*Lyonia fruticose*), fetterbush (*Lyonia lucida*), and round-pod St. John's wort was observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Eighty-two herbaceous species were recorded within the Dry Prairie (Reclamation) plant community for a total cover of 88.4%, which included 28.4% cover by species listed in the HCPMRM, 19.8% cover by other native species not listed in the HCPMRM, 15.5% cover by non-native species, and 24.7% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 11.6% of total cover (Table 63).

The most abundant species was natalgrass with 16.4% cover. Subdominant species included meadow joint-vetch (*Aeschynomene americana*; 6.0%), smutgrass (*Sporobolus indicus*; 5.8%), and broomsedge (5.6%) (Table 64). Seventy additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 65). A total of sixty-four species listed in the HCPMRM were observed. Thirty-eight HCPMRM listed species were observed reproducing naturally within the SUWH (Tables 64 and 65).

Seven nuisance species were recorded within the Dry Prairie (Reclamation) plant community for a total cover of 24.7% (Table 64). The most abundant nuisance species was natalgrass with 16.4% cover.

5.3.2 Dry Prairie (Enhancement)

Trees
Four tree species were recorded within the belt transects for a total density of 80 trees per acre (Table 66). Two of the four trees were listed in the HCPMRM for a density of 40 trees per acre. The dominant tree species was live oak and water oak, both with a density of 27 trees per acre. Total canopy cover accounted for 83.1% of habitat. No tree species showed signs of stress, no tree seedlings were observed, and no dead trees were recorded during the current monitoring event. No additional tree species were observed outside of the belt transects.

Shrubs
Two shrub species were documented within the belt transects for a total density of 40 shrubs per acre (Table 66). One shrub species, Eastern false-willow, was listed in the HCPMRM for a density of 27 trees per acre. No additional shrub species were observed outside of the belt transects.

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Herbaceous Vegetation
Twenty-three herbaceous species were recorded within the Dry Prairie (Enhancement) plant community for a total cover of 86.6%, which included 10.4% cover by species listed in the HCPMRM, 30.3% cover by other native species not listed in the HCPMRM, 4.7% cover by non-native species, and 41.2% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 13.4% of total cover (Table 63).

The most abundant species was cogon grass (*Imperata cylindrica*) with 19.7% cover. Subdominant species included yellow jessamine (*Gelsemium sempervirens;* 15.9%), caesarweed (*Urena lobata*; 13.3%), Japanese climbing fern (*Lygodium japonicum*; 6.7%), and saw greenbrier (*Smilax bona-nox*; 6.3%) (Table 67). Thirty-seven additional species were encountered within the Enhancements plant community, but outside the sampling area (Table 68). A total of twenty-seven species listed in the HCPMRM were observed. Fourteen HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 67 and 68).

Four nuisance species were recorded within the Dry Prairie (Enhancement) plant community for a total cover of 41.2% (Table 67). The most abundant nuisance species was cogon grass with 19.7% cover.

5.3.3 Dry Prairie (Native Area)

Trees
Six tree species were recorded within the belt transects for a total density of 52 trees per acre (Table 69). Two of the six trees were listed in the HCPMRM for a density of 8 trees per acre. The dominant species was turkey oak (*Quercus laevis*) with a density of 16 trees per acre. Total canopy cover accounted for 0.6% of habitat. No trees showed signs of stress at the time of the monitoring event and no tree seedlings were recorded. One additional tree species, cabbage palm, was observed outside of the belt transects but not included in the density calculations.

Shrubs
Eleven shrub species were recorded within the belt transects for a total density of 1,668 shrubs per acre (Table 69). Eight of the eleven shrub species were listed in the HCPMRM for a total density of 1,368 shrubs per acre (Table 69). Two additional shrub species, bigflower pawpaw and large seedbox, were observed outside of the transect but not included in the density calculations.

Herbaceous Vegetation
Forty-seven herbaceous species were recorded within the Dry Prairie (Native Area) plant community for a total cover of 68.3%, which included 51.9% cover by species listed in the HCPMRM, 9.0% cover by other native species not listed in the HCPMRM, 0.6% cover by non-native species, and 6.8% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 32.2% of total cover (Table 63).

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The dominant species was wiregrass with 21.8% cover. Subdominant species included bahia grass (6.1%) (Table 70). Forty additional species were encountered within the Native Area plant community, but outside the sampling area (Table 71). A total of fifty-six species listed in the HCPMRM were observed. Thirty-three HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 70 and 71).

Three nuisance species were recorded within the Dry Prairie (Native Area) plant community for a total cover of 6.8% (Table 70). The most abundant nuisance species was bahia grass with 6.1% cover.

5.3.4 Pine Flatwoods (Reclamation)

Trees
Five tree species were recorded within the belt transects for a total density of 88 trees per acre (Table 72). Four of the five trees were listed in the HCPMRM for a density of 84 trees per acre. The dominant species was slash pine with a density of 68 trees per acre. Total canopy cover accounted for 20.4% of habitat. Nine trees showed signs of stress (21.4% of all trees) at the time of the monitoring event. Two tree seedlings and sixteen dead tree was recorded, but not included in the density calculations. No additional tree species were observed outside of the belt transects.

Shrubs
Two shrub species, all of which are listed in the HCPMRM, were documented within the belt transects for a total density of 104 shrubs per acre (Table 72). The dominant shrub species was saw palmetto with a density of 64 shrubs per acre. Two additional shrub species, bigflower pawpaw and shiny blueberry (*Vaccinium myrsinites*), were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Seventy-seven herbaceous species were recorded within the Pine Flatwoods (Reclamation) plant community for a total cover of 68.2%, which included 27.4% cover by species listed in the HCPMRM, 12.1% cover by other native species not listed in the HCPMRM, 14.8% cover by non-native species, and 13.9% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 32.4% of total cover (Table 63).

The most abundant species was Bahia grass with 8.3% cover. Subdominant species included caesarweed (4.7%) (Table 73). Three-five additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 74). A total of sixty-two species listed in the HCPMRM were observed. Thirty-nine HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 73 and 74).

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Six nuisance species were recorded within the Pine Flatwoods (Reclamation) plant community for a total cover of 13.9% (Table 73). The most abundant nuisance species was bahia grass with 8.3% cover.

5.3.5 Pine Flatwoods (Enhancement)

Trees
Five tree species were recorded within the belt transects for a total density of 387 trees per acre (Table 75). Three of the five tree species were listed in the HCPMRM for a density of 307 trees per acre. The dominant species were wax myrtle and slash pine, both with a density of 147 trees per acre. Total canopy cover accounted for 29.6% of habitat. Four trees showed signs of stress (13.8% of all trees) at the time of the monitoring event. No trees seedlings were observed, and four dead trees were recorded. No additional tree species were observed outside of the belt transects.

Shrubs
One listed shrub species, saw palmetto, was documented within the belt transects for a total density of 27 shrubs per acre (Table 75). Two additional shrub species, round-pod St. John's wort and shiny blueberry, were observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation
Thirty herbaceous species were recorded within the Pine Flatwoods (Enhancement) plant community for a total cover of 80.5%, which included 38.9% cover by species listed in the HCPMRM, and 17.3% cover by other native species not listed in the HCPMRM, 4.0% cover by non-native species, and 20.3% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 19.6% of total cover (Table 63).

The most abundant species was Bahia grass with 19.9% cover. Subdominant species included cinnamon fern (*Osmunda cinnamomea*; 11.3%), yellow-eyed grass (*Xyris sp.*; 9.6%), and slender goldenrod (5.9%) (Table 76). Thirty-one additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 77). A total of forty-two species listed in the HCPMRM were observed. Twenty-eight HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 76 and 77).

Two nuisance species were recorded within the Pine Flatwoods (Enhancement) plant community for a total cover 20.3% (Table 76). The most abundant nuisance species was bahia grass with 19.9% cover.

5.3.6 Pine Flatwoods (Native Area)

Trees
Four tree species were recorded within the belt transects for a total density of 160 trees per acre (Table 78). Three of four species were listed in the HCPMRM for a density

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of 110 trees per acre. The dominant species was live oak with a density of 80 trees per acre. Total canopy cover accounted for 84.6% of habitat. One tree showed signs of stress (6.3% of all trees) at the time of the monitoring event. Thirty tree seedlings were observed, and two dead trees were recorded. No additional tree species were observed outside of the belt transects.

Shrubs

Three shrub species, all of which were listed in the HCPMRM, were documented within the belt transects for a total density of 860 shrubs per acre (Table 78). The dominant shrub species was saw palmetto with a density of 490 shrubs per acre. Five additional shrub specie, American beauty-berry, round-pod St. John's wort, winged sumac, shiny blueberry, and bigflower pawpaw, were observed outside the belt transects but not included in the density calculations.

Herbaceous Vegetation

Twenty-four herbaceous species were recorded within the Pine Flatwoods (Native Area) plant community for a total cover of 63.7%, which included 48.7% cover by species listed in the HCPMRM, 14.7% cover by other native species not listed in the HCPMRM, and 0.3% cover by non-native herbaceous species. Bare ground and/or dead litter accounted for approximately 36.4% of total cover (Table 63).

The dominant species was red-top panic grass (*Panicum rigidulum*) with 10.6% cover. The subdominant species included creeping little bluestem (*Schizachyrium stoloniferum*; 7.5%), splitbread bluestem (*Andropogon ternarius*; 7.4%), muscadine grape (*Vitis rotundifolia*; 5.9%), and wire grass (5.0%) (Table 79). Thirty-two additional species were encountered within the Native Area plant community, but outside the sampling area (Table 80). A total of forty-two species listed in the HCPMRM were observed. Twenty-five HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 79 and 80).

No nuisance species were recorded within the Pine Flatwoods (Native Area) plant community at time of the monitoring event (Table 79).

5.3.7 Temperate Hardwoods (Reclamation)

Trees

Four tree species were recorded within the belt transects for a total density of 98 trees per acre (Table 81). Three of four species were listed in the HCPMRM for a density of 92 trees per acre. The dominant species was wax myrtle with a density of 46 trees per acre. Total canopy cover accounted for 13.2% of habitat. No trees showed signs of stress at the time of the monitoring event. No listed tree seedlings were observed, and 10 dead trees were recorded. No additional tree species were observed outside of the belt transects.

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Shrubs
Two shrub species, all of which are listed in the HCPMRM, were documented within the belt transects for a total density of 52 shrubs per acre (Table 81). The dominant shrub species was saw palmetto with a density of 29 shrubs per acre. No additional shrub species were observed outside of the transects.

Herbaceous Vegetation
Thirty-two herbaceous species were recorded within the Temperate Hardwood (Reclamation) plant community for a total cover of 91.0%, which included 18.6% cover by species listed in the HCPMRM, 25.4% cover by other native species not listed in the HCPMRM, 16.8% cover by non-native species, and 30.2% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 9.3% of total cover (Table 63).

The most abundant species was false moneywort with 12.0% cover. The subdominant species included caesarweed (10.2%), climbing hempvine (*Mikania scandens*; 8.0%), white beggar-ticks (*Bidens alba*; 7.7%), large seedbox (6.6%), Bahia grass (6.1%), meadow joint-vetch (5.3%), and dogfennel (5.0%) (Table 82). Thirty-nine additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 83). A total of twelve species listed in the HCPMRM were observed. Six HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 82 and 83).

Seven nuisance species were recorded within the Temperate Hardwood (Reclamation) plant community for a total cover of 30.2% (Table 82). The most abundant nuisance species was caesarweed with 10.2% cover.

5.3.8 Temperate Hardwoods (Enhancement)

Trees
Six tree species, all of which are listed in the HCPMRM, were recorded within the belt transects for a total density of 280 trees per acre (Table 84). The dominant species was slash pine with a density of 120 trees per acre. Total canopy cover accounted for 89.8% of habitat. One tree showed signs of stress (4.8% of all trees) at the time of the monitoring event. No tree seedlings were observed, and no dead trees were recorded. No additional tree species were observed outside of the belt transects.

Shrubs
Two shrub species were recorded within the belt transects for a total density of 40 shrubs per acre (Table 84). One of the two shrub species, St. Andrew's cross, was listed in the HCPMRM for a total density of 13 shrubs per acre (Table 69). No additional shrub species were observed outside of the transects.

Herbaceous Vegetation
Twenty-two herbaceous species were recorded within the Temperate Hardwoods (Enhancement) plant community for a total cover of 65.2%, which included 33.0%

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cover by species listed in the HCPMRM, 12.6% cover by other native species not listed in the HCPMRM, 11.6% cover by non-native species, and 8.0% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 34.8% of total cover (Table 63).

The dominant species was yellow jessamine with 14.3% cover. Subdominant species included bitter ginger (*Zingiber zerumbet*; 10.8%), saw greenbrier (6.7%), and knotroot bristle grass (*Setaria parviflora*; 5.4%) (Table 85). Thirty additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 86). A total of twenty-four species listed in the HCPMRM were observed. Fourteen HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 85 and 86).

Two nuisance species were recorded within the Temperate Hardwoods (Enhancement) plant community for a total cover of 8.0% (Table 85). The most abundant nuisance species was caesarweed with 4.4% cover.

5.3.9 Temperate Hardwoods (Native Area)

Trees

Five tree species were recorded within the belt transects for a total density of 260 trees per acre (Table 87). Three of the five trees were listed in the HCPMRM for a total density of 240 trees per acre. The dominant species was laurel oak with a density of 130 trees per acre. Total canopy cover accounted for 53.3% of habitat. Two trees showed signs of stress (7.7% of all trees) at the time of the monitoring event. No tree seedlings were observed, and three dead trees were recorded. Three additional tree species, red maple, sweetgum, and slash pine were observed outside of the belt transects but not included in the density calculations.

Shrubs

Four shrub species were documented within the belt transect for a total density of 450 shrubs per acre (Table 87). Three of the four shrub species were listed in the HCPMRM for a total density of 330 shrubs per acre. One additional shrub species, large seedbox, was observed outside of the belt transects but not included in the density calculations.

Herbaceous Vegetation

Twenty-seven herbaceous species were recorded within the Temperate Hardwoods (Native Area) plant community for a total cover of 44.7%, which included 17.6% cover by species listed in the HCPMRM, 10.8% cover by other native species not listed in the HCPMRM, 0.6% cover by non-native species, and 15.7% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 55.4% of total cover (Table 63).

The most abundant species was caesarweed with 11.9% cover (Table 88). Forty-five additional species were encountered within the Native Area plant community, but

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outside the sampling area (Table 89). A total of twenty-seven species listed in the HCPMRM were observed. Six HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 88 and 89).

Four nuisance species were recorded within the Temperate Hardwood (Native Area) plant community for a total cover of 15.7% (Table 88). The most abundant nuisance species was caesarweed with 11.9% cover.

5.3.10 Xeric Oak (Reclamation)

Trees
One tree species, sand live oak, which is listed in the HCPMRM, were recorded within the belt transects for a total density of 80 trees per acre (Table 90). No trees showed signs of stress at the time of the monitoring event. No tree seedlings were observed, and two dead trees were recorded. No additional tree species were observed outside of the belt transects.

Shrubs
Two shrub species, all of which are listed in the HCPMRM, were documented within the belt transects for a total density of 550 shrubs per acre (Table 90). The dominant shrub species was saw palmetto with a density of 460 shrubs per acre. Seven additional shrub species, St. John's wort, large seedbox, bigflower pawpaw, American beauty-berry, shiny blueberry, round-pod St. John's wort, and highbush blueberry were observed outside the belt transects but not included in the density calculations.

Herbaceous Vegetation
Twenty-seven herbaceous species were recorded within the Xeric Oak (Reclamation) plant community for a total cover of 87.4%, which included 19.4% cover by species listed in the HCPMRM, 18.7% cover by other native species not listed in the HCPMRM, 6.6% cover by non-native species, and 42.7% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 12.6% of total cover (Table 63).

The most abundant species was Bahia grass with 30.3% cover. Subdominant species included natalgrass (10.5%), rustweed (*Polypremum procumbens*; 6.4%), and broomsedge (6.1%) (Table 91). Fifty-four additional species were encountered within the Reclamation plant community, but outside the sampling area (Table 92). A total of twenty-five species listed in the HCPMRM were observed. Thirteen HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 91 and 92).

Four nuisance species were recorded within the Xeric Oak (Reclamation) plant community for a total cover of 42.7% (Table 91). The most abundant nuisance species was Bahia grass with 30.3% cover.

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5.3.11 Xeric Oak (Enhancement)

Trees
Two tree species were recorded within the belt transects for a total density of 586 trees per acre (Table 93). One of the two trees, sand live oak, was listed in the HCPMRM for a total density of 573 trees per acre. No trees showed signs of stress at the time of the monitoring event. Twenty tree seedlings were observed, and no dead trees were recorded during the current monitoring event. No additional tree species were observed outside of the belt transects.

Shrubs
One listed HCPMRM shrub species, saw palmetto, was documented within the belt transect, for a total density of 307 shrubs per acre (Table 93). Five additional shrub species, shiny blueberry, bigflower pawpaw, winged sumac, St. John's wort, and running oak were observed outside of the transects but not included in the density calculations.

Herbaceous Vegetation
Seventeen herbaceous species were recorded within the Xeric Oak (Enhancement) plant community for a total cover of 34.9%, which included 16.6% cover by species listed in the HCPMRM, 13.3% cover by other native species not listed in the HCPMRM, 1.0% cover by non-native species, and 4.0% cover by nuisance herbaceous species. Bare ground and/or dead litter accounted for approximately 65.2% of total cover (Table 63).

The dominant species was red-top panic grass with 6.3% cover. The subdominant species included panic grass (*Dichanthelium acuminatum*; 5.5%) and sand live oak (5.0%) (Table 94). Twenty-two additional species were encountered within the Enhancement plant community, but outside the sampling area (Table 95). A total of twenty-two species listed in the HCPMRM were observed. Eight species listed in the HCPMRM were measured or observed reproducing naturally within the SUWH (Tables 94 and 95).

Two nuisance species were recorded within the Xeric Oak (Enhancement) plant community for a total cover of 4.0% (Table 94). The most abundant nuisance species was caesarweed with 3.2% cover.

5.3.12 Xeric Oak (Native Area)

Trees
Three tree species were recorded within the belt transects for a total density of 241 trees per acre (Table 96). One of the three tree species, sand live oak, was listed in the HCPMRM for a total density of 187 trees per acre. No listed trees showed signs of stress at the time of the monitoring event. No listed trees seedlings were observed, and two dead trees were recorded. Three additional tree species, turkey oak, laurel oak,

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and red bay were observed outside of the belt transects but not included in the density calculations.

Shrubs
Two shrub species, both of which are listed in the HCPMRM, were documented within the belt transect for a total density of 520 shrubs per acre (Table 96). The dominant shrub species was saw palmetto with a density of 480 shrubs per acre. Six additional shrub species, shiny blueberry, winged sumac, round-pod St. John's wort, St. John's wort, running oak, and highbush blueberry were observed outside of the transects but not included in the density calculations.

Herbaceous Vegetation
Fourteen herbaceous species were recorded within the Xeric Oak (Native Area) plant community for a total cover of 32.2%, which included 26.2% cover by species listed in the HCPMRM, 5.6% cover by other native species not listed in the HCPMRM, and 0.4% cover by nuisance species. Bare ground and/or dead litter accounted for approximately 67.8% of total cover (Table 63).

The dominant species was saw palmetto with 9.3% cover (Table 97). The subdominant species was wiregrass (8.8%) (Table 97). Thirty-six additional species were encountered within the Native Area plant community, but outside the sampling area (Table 98). A total of twenty-two species listed in the HCPMRM were observed. Ten HCPMRM listed species were measured or observed reproducing naturally within the SUWH (Tables 97 and 98).

One nuisance species, caesarweed, was recorded within the Xeric Oak (Native Area) with 0.4% cover (Table 97).

5.3.13 Wildlife Utilization (Fall)

Dry Prairie (Reclamation)
Eighty-four wildlife species have been observed since the baseline monitoring event, including sixty-two avian species, fifty-eight of which are listed in manual, seven reptilian species, six of which are listed in manual, five amphibian species, all of which are listed in manual, and ten mammalian species, eight of which are listed in manual (Table 111). Twenty-eight wildlife species were observed during the current monitoring event, eight of which were observed for the first time. Of the eighty-four species, seventy-six are native vertebrates known or suspected to occur in Hillsborough County.

Dry Prairie (Enhancement)
Forty-four wildlife species have been observed since the baseline monitoring event, including twenty-nine avian species, twenty-eight of which are listed in manual, four reptilian species, three of which are listed in manual, three amphibian species, all of which are listed in manual, and eight mammalian species, six of which are listed in manual (Table 112). Sixteen wildlife species were observed during the current

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monitoring event, two of which were observed for the first time. Of the forty-four species, forty are native vertebrates known or suspected to occur in Hillsborough County.

Dry Prairie (Native Area)
Forty wildlife species have been observed since the baseline monitoring event, including twenty-eight avian species, all of which are listed in manual, four reptilian species, three of which are listed in manual, two amphibian species, both of which are listed in manual, and six mammalian species, three of which are listed in manual (Table 113). Fifteen wildlife species were observed during the current monitoring event, seven of which were observed for the first time. Of the forty species, thirty-six are native vertebrates known or suspected to occur in Hillsborough County.

Pine Flatwoods (Reclamation)
Fifty-four wildlife species have been observed since the baseline monitoring event, including thirty-seven avian species, thirty-six of which are listed in manual, five reptilian species, three of which are listed in manual, two amphibian species, both of which are listed in manual, and ten mammalian species, eight of which are listed in manual (Table 114). Eleven wildlife species were observed during the current monitoring event, three of which were observed for the first time. Of the fifty-four species, forty-nine are native vertebrates known or suspected to occur in Hillsborough County.

Pine Flatwoods (Enhancement)
Twenty-nine wildlife species have been observed since the baseline monitoring event, including nineteen avian species, eighteen of which are listed in manual, two reptilian species, one of which is listed in manual, two amphibian species, both of which are listed in manual, and six mammalian species, four of which are listed in manual (Table 115). Seven wildlife species were observed during the current monitoring event, one of which was observed for the first time. Of the twenty-nine species, twenty-five are native vertebrates known or suspected to occur in Hillsborough County.

Pine Flatwoods (Native Area)
Twenty-six wildlife species have been observed since the baseline monitoring event, including eighteen avian species, all of which are listed in manual, three reptilian species, two of which are listed in manual, one amphibian species, all of which are listed in manual, and four mammalian species, two of which are listed in manual (Table 116). Ten wildlife species were observed during the current monitoring event, one of which was observed for the first time. Of the twenty-six species, twenty-three are native vertebrates known or suspected to occur in Hillsborough County.

Temperate Hardwoods (Reclamation)
Twenty-six wildlife species have been observed since the baseline monitoring event, including nineteen avian species, eighteen of which are listed in manual, two reptilian species, one of which is listed in manual, and five mammalian species, three of which are listed in table (Table 117). Eleven wildlife species were observed during the

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current monitoring event, three of which were observed for the first time. Of the twenty-six species, twenty-two are native vertebrates known or suspected to occur in Hillsborough County.

Temperate Hardwoods (Enhancement)
Twenty-six wildlife species have been observed since the baseline monitoring event, including sixteen avian species, all of which are listed in manual, three reptilian species, two of which are listed in manual, one amphibian species, all of which are listed in manual, and six mammalian species, four of which are listed in table (Table 118). Seven wildlife species were observed during the current monitoring event, one of which was observed for the first time. Of the twenty-six species, twenty-three are native vertebrates known or suspected to occur in Hillsborough County.

Temperate Hardwoods (Native Area)
Twenty-one wildlife species have been observed since the baseline monitoring event, including eleven avian species, all of which are listed in manual, five reptilian species, four of which are listed in manual, two amphibian species, both of which are listed in manual, and three mammalian species, one of which is listed in manual (Table 119). Ten wildlife species were observed during the current monitoring event, all of which have been observed previously. Of the twenty-one species, eighteen are native vertebrates known or suspected to occur in Hillsborough County.

Xeric Oak (Reclamation)
Twenty-six wildlife species have been observed since the baseline monitoring event, including eighteen avian species, seventeen of which are listed in manual, three reptilian species, two of which are listed in manual, one amphibian species, all of which are listed in manual, and four mammalian species, two of which are listed in manual (Table 120). Eight wildlife species were observed during the current monitoring event, all of which have been observed previously. Of the twenty-six species, twenty-two are native vertebrates known or suspected to occur in Hillsborough County.

Xeric Oak (Enhancement)
Thirty-five wildlife species have been observed since the baseline monitoring event, including twenty-three avian species, all of which are listed in manual, four reptilian species, three of which are listed in manual, two amphibian species, both of which are listed in manual, and six mammalian species, four of which are listed in manual (Table 121). Seventeen wildlife species were observed during the current monitoring event, all of which were observed previously. Of the thirty-five species, thirty-two are native vertebrates known or suspected to occur in Hillsborough County.

Xeric Oak (Native Area)
Thirty-three wildlife species have been observed since the baseline monitoring event, including twenty-three avian species, twenty-two of which are listed in table, two reptilian species, both of which are listed in table, one amphibian species, all of which are listed in table, and seven mammalian species, five of which are listed in manual

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(Table 122). Twelve wildlife species were observed during the current monitoring event, eight of which were observed for the first time. Of the thirty-three species, thirty are native vertebrates known or suspected to occur in Hillsborough County.

6.0 PROBLEM AREAS

The SUWH did not meet the minimum number of small mammal species.

The minimum number of anuran species, lizard species, snake species, and total mammal species have historically been observed but not during the 2024 monitoring events.

Dry Prairie (Reclamation) and (Enhancement), Pine Flatwoods (Reclamation) and (Enhancement), Temperate Hardwoods (Reclamation) and (Native), and Xeric Oak (Reclamation) did not meet the nuisance species criterion.

Pine Flatwoods (Reclamation) and (Native) did not meet the mesic groundcover species requirement. Xeric Oak (all habitats) did not meet the number of groundcover species.
Dry Prairie (Enhancement) and Pine Flatwoods (all habitats) did not meet the success criteria for canopy cover. Pine Flatwoods (all habitats) and Temperate Hardwoods (Reclamation) did not meet their requirements for tree density. Pine Flatwoods (Enhancement) and Temperate Hardwoods (all habitats) did not meet the minimum number of listed tree species.

Dry Prairie (Enhancement), Pine Flatwoods (Enhancement), Temperate Hardwoods (Enhancement) did not meet the shrub density requirements. Dry Prairie (Enhancement), Pine Flatwoods (Reclamation) and (Enhancement), Temperate Hardwoods (all habitats), and Xeric Oak (Enhancement) and (Native) did not meet the minimum number of listed shrub species.

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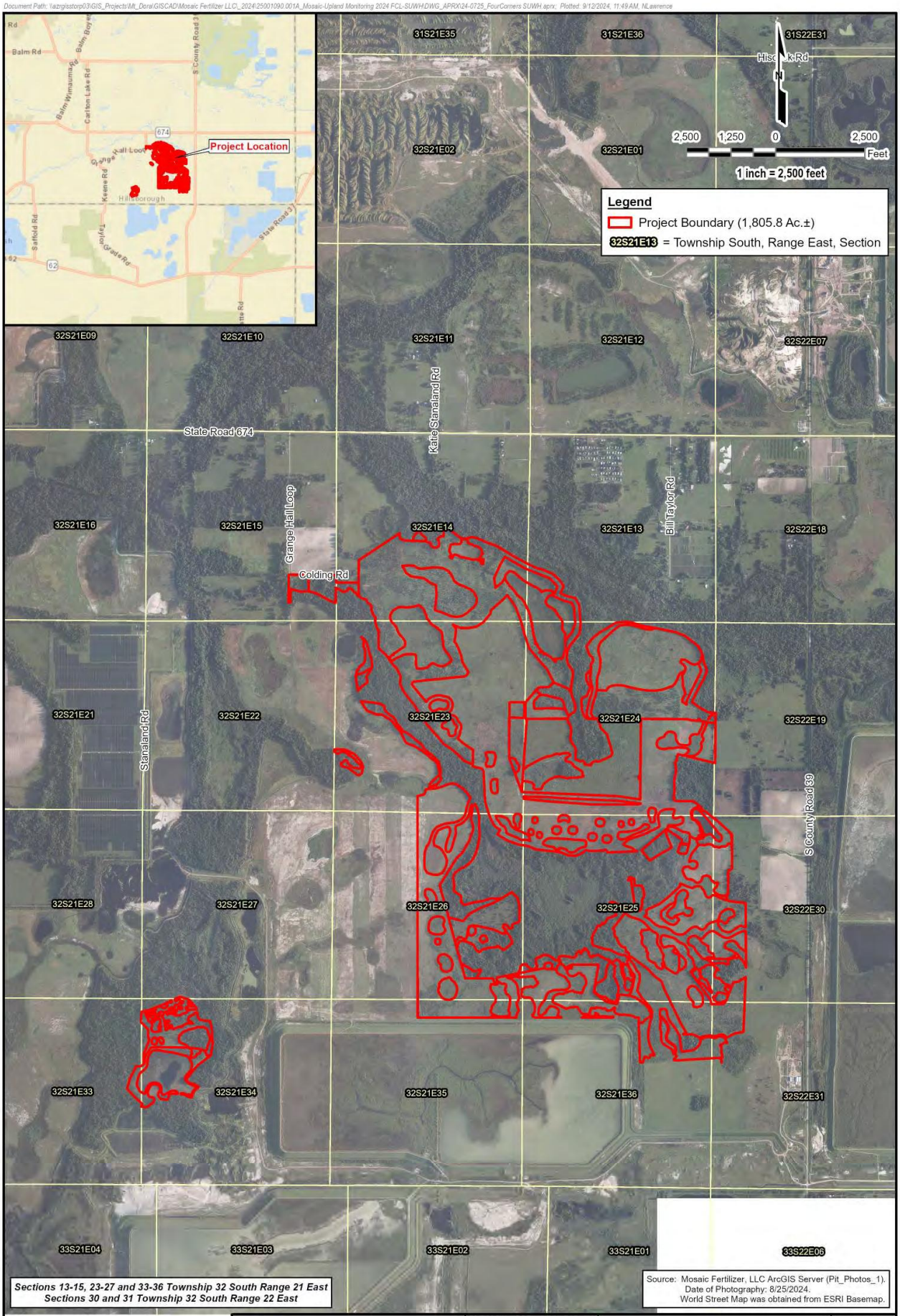
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FIGURES

Document Path: \\azrgisstorp03\GIS_Projects\Mt_Dora\GISCAD\Mosaic Fertilizer LLC_2024\25001090.001A_Mosaic-Upland Monitoring 2024 FCL-SUWH\DWG_APRX\24-0725_FourCorners SUWH.aprx; Plotted: 9/12/2024, 11:49 AM, NLawrence



Sections 13-15, 23-27 and 33-36 Township 32 South Range 21 East
Sections 30 and 31 Township 32 South Range 22 East

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Date of Photography: 8/25/2024.
World Street Map was obtained from ESRI Basemap.

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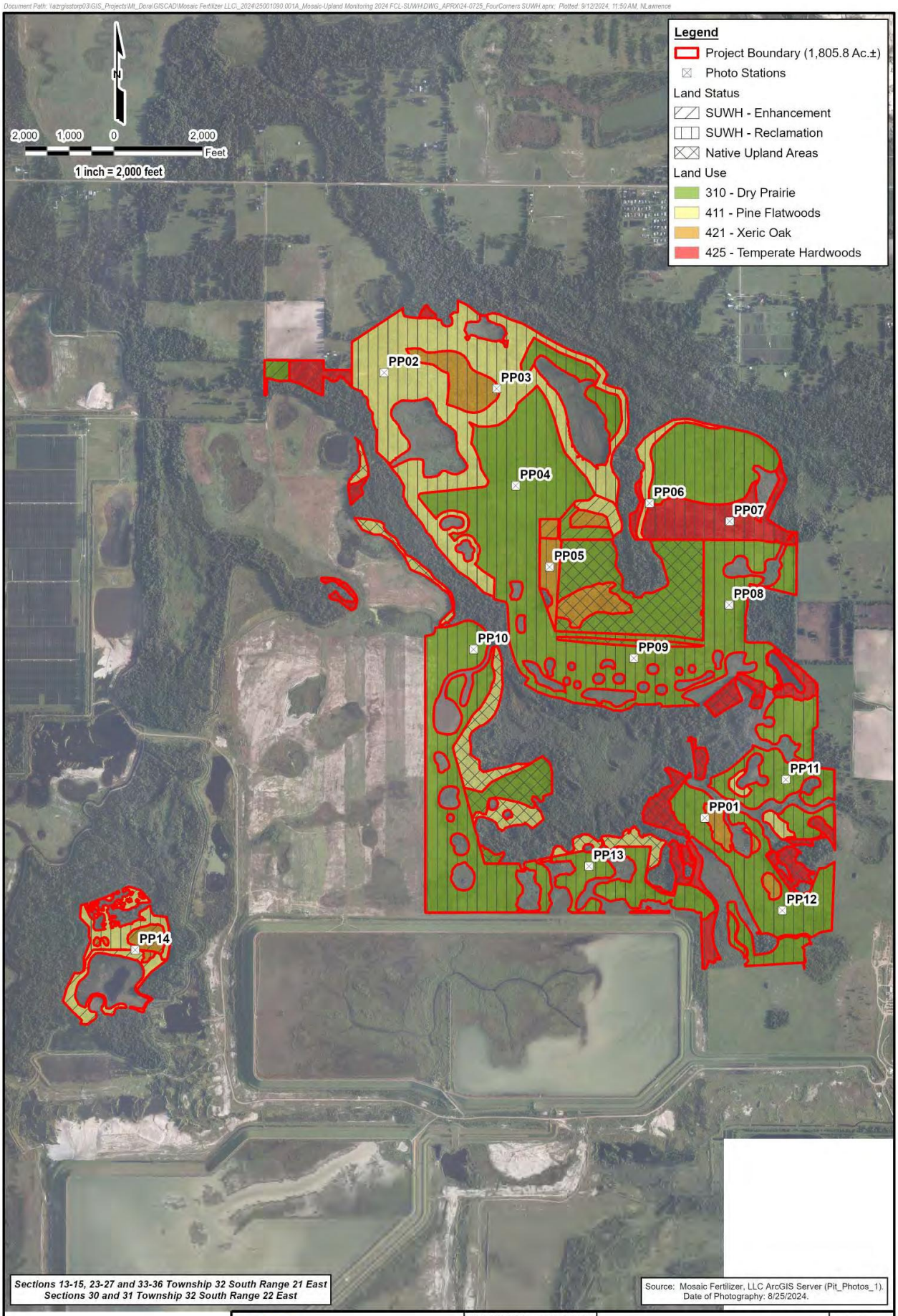
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FILE NAME:	24-0725_FourCorners SUWH.aprx

Project Location Map

Mosaic Fertilizer, LLC.
Four Corners Mine
Significant Upland Wildlife Habitat
Hillsborough County, Florida

FIGURE
1

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Sections 13-15, 23-27 and 33-36 Township 32 South Range 21 East
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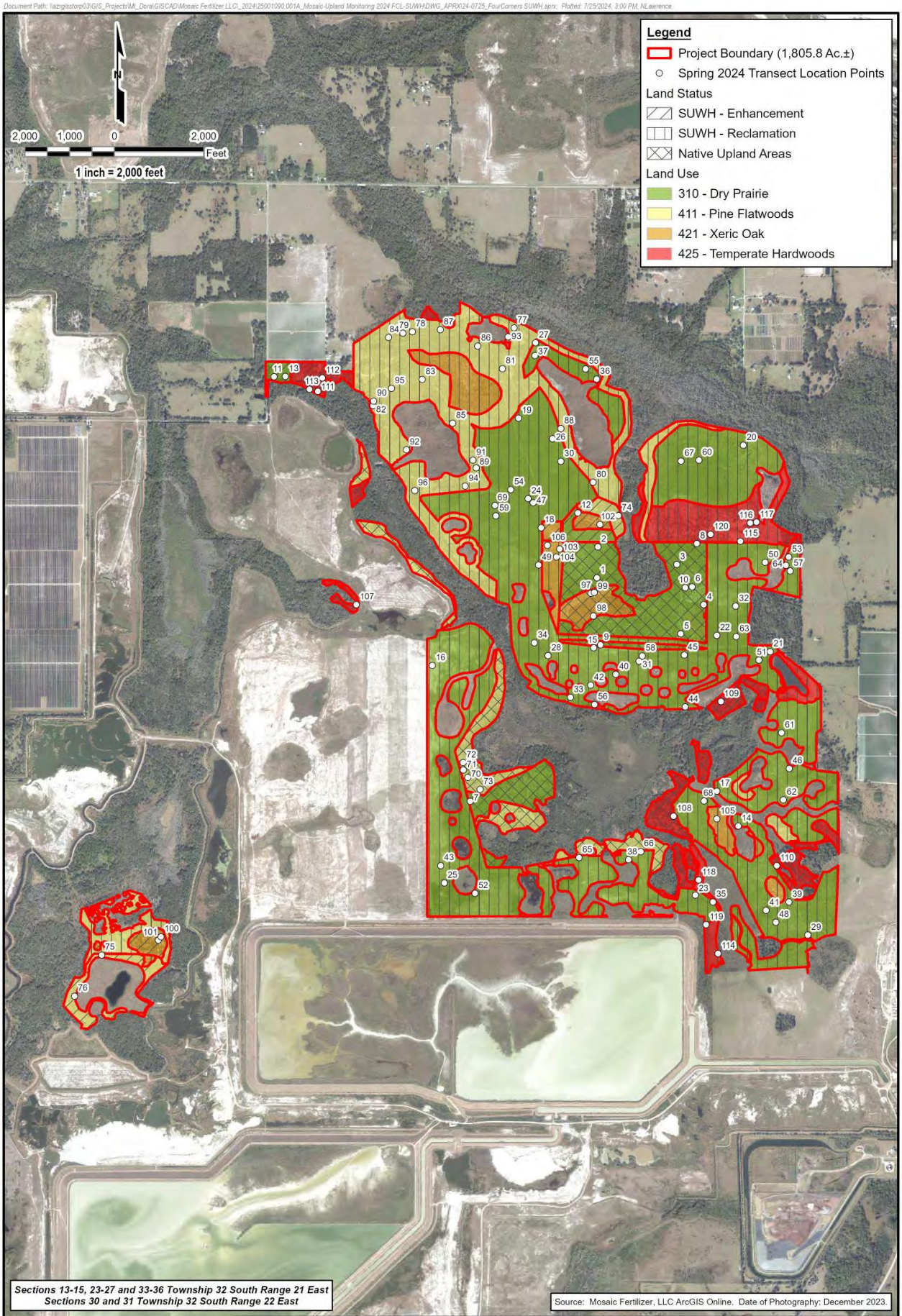
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Photo Station Location Map

Mosaic Fertilizer, LLC.
Four Corners Mine
Significant Upland Wildlife Habitat
Hillsborough County, Florida

FIGURE
2

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Sections 13-15, 23-27 and 33-36 Township 32 South Range 21 East
Sections 30 and 31 Township 32 South Range 22 East

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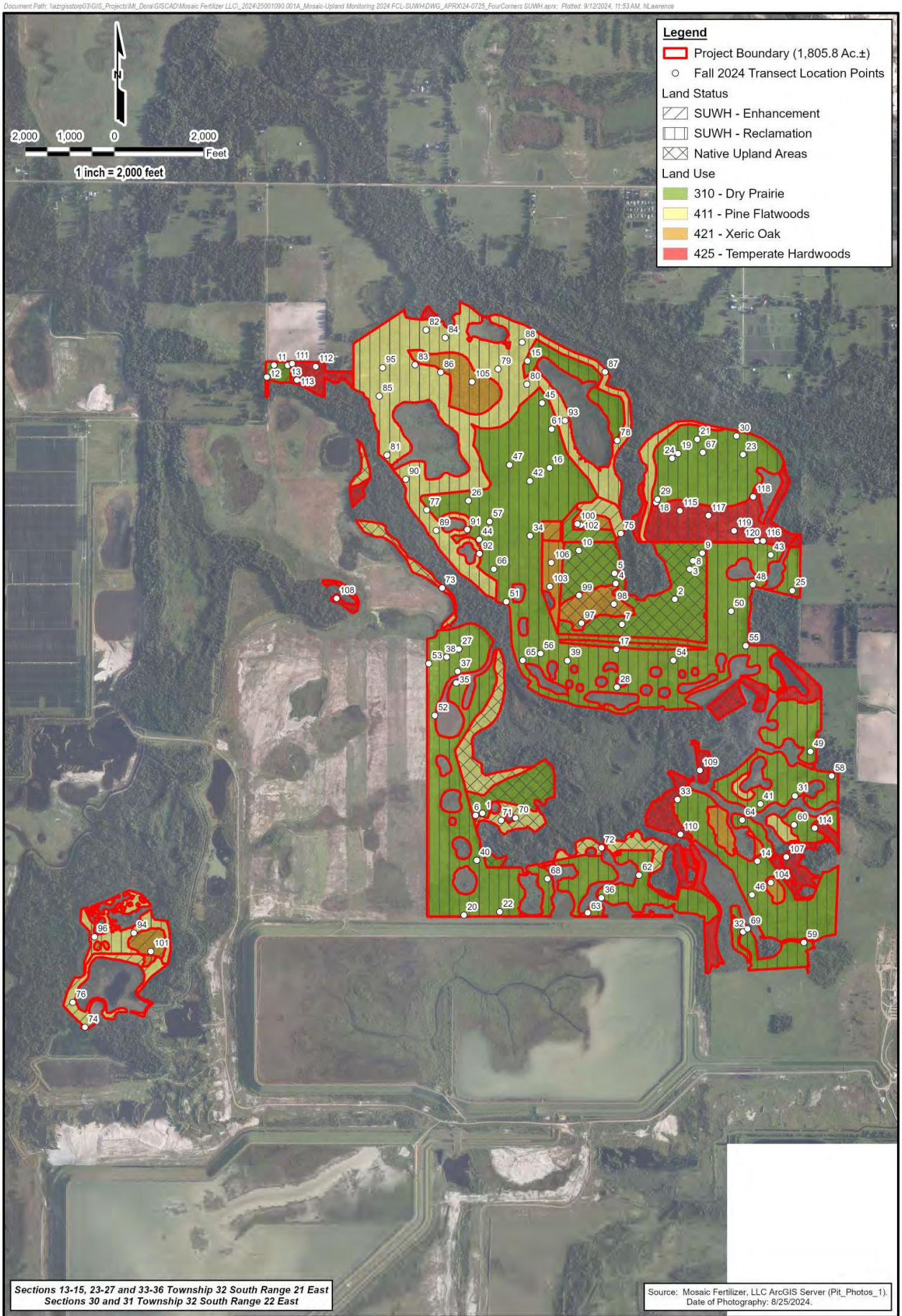
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Transect Location Map - Spring

Mosaic Fertilizer, LLC.
Four Corners Mine
Significant Upland Wildlife Habitat
Hillsborough County, Florida

FIGURE
3A

Document Path: \\azrgisstorp03\GIS_Projects\Mt_Dora\GIS\CAD\Mosaic Fertilizer LLC_2024\25001090.001A_Mosaic-Upland Monitoring 2024 FCL-SUWH\DWG_APRX\24-0725_FourCorners SUWH.aprx; Plotted: 9/12/2024, 11:53 AM, NLawrence



Sections 13-15, 23-27 and 33-36 Township 32 South Range 21 East
Sections 30 and 31 Township 32 South Range 22 East

Source: Mosaic Fertilizer, LLC ArcGIS Server (Pit_Photos_1).
Date of Photography: 8/25/2024.

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Transect Location Map - Fall

Mosaic Fertilizer, LLC.
Four Corners Mine
Significant Upland Wildlife Habitat
Hillsborough County, Florida

FIGURE
3B

TABLES

TABLE 1: TREE DENSITY BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	37	1	38	27	52.8	2.5	0
Quercus virginiana	Live oak	UPL	29	1	30	21	41.7	3.1	0
Pinus elliottii	Slash pine	UPL	3	0	3	2	4.2	0.9	0
Tree Species Listed In Table Subtotals			**69**	**2**	**71**	**50**	**98.6**	**6.5**	**0**
Tree Species Not Listed in Table									
Quercus geminata	Sand live oak	UPL	1	0	1	1	1.4	0.2	0
Tree Species Not Listed in Table Subtotals			**1**	**0**	**1**	**1**	**1.4**	**0.2**	**0**
TOTALS			**70**	**2**	**72**	**51**	**100.0**	**6.7**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	96	0	96	69
Baccharis halimifolia	Eastern false-willow	FAC	31	0	31	22
Vaccinium myrsinites	Shiny blueberry	UPL	10	0	10	7
Lyonia lucida	Fetterbush	FACW	5	0	5	4
Hypericum tetrapetalum	St. John's wort	FAC	1	0	1	1
TOTALS			**143**	**0**	**143**	**103**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 2: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Dry Prairie (Reclamation)		
Species Listed in Tables[1]	44	32.9
Other Species Not Listed in Tables	26	12.6
Non-native Species	14	12.4
Nuisance Species[2]	12	12.5
Total Species Cover	96	70.4
Total Bare Ground/Dead Litter	-	31.2
Dry Prairie (Enhancement)		
Species Listed in Tables[1]	13	37.7
Other Species Not Listed in Tables	12	18.6
Non-native Species	2	4.8
Nuisance Species[2]	3	25.9
Total Species Cover	30	87.0
Total Bare Ground/Dead Litter	-	13.0
Dry Prairie (Native Area)		
Species Listed in Tables[1]	33	66.5
Other Species Not Listed in Tables	16	8.0
Non-native Species	1	0.3
Nuisance Species[2]	2	1.8
Total Species Cover	52	76.6
Total Bare Ground/Dead Litter	-	24.3

TABLE 2: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Pine Flatwoods (Reclamation)		
Species Listed in Tables[1]	46	25.4
Other Species Not Listed in Tables	19	13.7
Non-native Species	13	12.7
Nuisance Species[2]	10	22.7
Total Species Cover	88	74.5
Total Bare Ground/Dead Litter	-	26.2
Pine Flatwoods (Enhancement)		
Species Listed in Tables[1]	17	47.3
Other Species Not Listed in Tables	4	5.3
Non-native Species	1	1.9
Nuisance Species[2]	2	28.5
Total Species Cover	24	83.0
Total Bare Ground/Dead Litter	-	17.0
Pine Flatwoods (Native Area)		
Species Listed in Tables[1]	16	74.5
Other Species Not Listed in Tables	6	15.9
Total Species Cover	22	90.4
Total Bare Ground/Dead Litter	-	9.6

TABLE 2: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Temperate Hardwoods (Reclamation)		
Species Listed in Tables[1]	16	34.2
Other Species Not Listed in Tables	17	16.0
Non-native Species	8	16.4
Nuisance Species[2]	7	12.0
Total Species Cover	48	78.6
Total Bare Ground/Dead Litter	-	21.8
Temperate Hardwoods (Enhancement)		
Species Listed in Tables[1]	14	32.6
Other Species Not Listed in Tables	4	5.0
Nuisance Species[2]	2	1.8
Total Species Cover	20	39.4
Total Bare Ground/Dead Litter	-	60.6
Temperate Hardwoods (Native Area)		
Species Listed in Tables[1]	9	23.4
Other Species Not Listed in Tables	6	5.5
Nuisance Species[2]	3	27.4
Total Species Cover	18	56.3
Total Bare Ground/Dead Litter	-	43.7

TABLE 2: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Xeric Oak (Reclamation)		
Species Listed in Tables[1]	18	44.4
Other Species Not Listed in Tables	8	13.5
Non-native Species	1	0.9
Nuisance Species[2]	1	5.9
Total Species Cover	28	64.7
Total Bare Ground/Dead Litter	-	35.3
Xeric Oak (Enhancement)		
Species Listed in Tables[1]	13	27.3
Other Species Not Listed in Tables	8	12.2
Total Species Cover	21	39.5
Total Bare Ground/Dead Litter	-	60.5
Xeric Oak (Native Area)		
Species Listed in Tables[1]	15	42.3
Other Species Not Listed in Tables	5	10.4
Non-native Species	1	2.1
Total Species Cover	21	54.8
Total Bare Ground/Dead Litter	-	45.2

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

TABLE 3: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables(1)				
Andropogon virginicus	Broomsedge	FAC	ǂ	6.1
Scoparia dulcis	Licorice weed	FAC	ǂ	3.5
Digitaria ciliaris	Southern crabgrass	UPL	ǂ	2.8
Serenoa repens	Saw palmetto	UPL	ǂ	2.5
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	1.9
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	1.7
Eupatorium capillifolium	Dogfennel	FAC		1.6
Aristida stricta	Wiregrass	FAC		1.5
Coreopsis leavenworthii	Leavenworth's tickseed	FACW	ǂ	1.3
Galactia elliotii	Milkpea	UPL		1.3
Ambrosia artemisiifolia	Common ragweed	UPL		0.9
Juncus scirpoides	Needlepod rush	OBL	ǂ	0.8
Euthamia caroliniana	Slender goldenrod	FAC		0.7
Syngonanthus flavidulus	Bantam-buttons	FACW	ǂ	0.7
Eustachys glauca	Saltmarsh fingergrass	FACW	ǂ	0.6
Juncus marginatus	Grassleaf rush	FACW	ǂ	0.5
Erechtites hieraciifolius	Fireweed	FAC		0.4
Axonopus fissifolius	Southern carpet grass	FAC	ǂ	0.3
Erigeron quercifolius	Oak-leaf fleabane	FAC		0.3
Myrica cerifera	Wax myrtle	FAC		0.3
Oxalis corniculata	Yellow wood sorrel	UPL	ǂ	0.3
Bidens alba (synonym B. pilosa)	White beggar-ticks	FAC	ǂ	0.2
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.2
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.2
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.2
Paspalum setaceum	Thin paspalum	FAC		0.2
Solidago fistulosa	Pine-barren goldenrod	FACW		0.2
Buchnera americana	American bluehearts	UPL	ǂ	0.1
Chamaecrista nictitans	Wild sensitive plant	UPL	ǂ	0.1
Desmodium incanum	Zarzabacao comun	UPL	ǂ	0.1
Digitaria serotina	Hairy crabgrass	FAC		0.1
Gamochaeta pensylvanica	Pennsylvania everlasting	UPL	ǂ	0.1
Hydrocotyle umbellata	Manyflower marshpennywort	FACW		0.1
Hypericum tetrapetalum	St. John's wort	FAC	ǂ	0.1
Ipomoea cordatotriloba	Tievine	-	ǂ	0.1
Lyonia lucida	Fetterbush	FACW		0.1
Pinus elliottii	Slash pine	UPL		0.1
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	0.1
Pterocaulon pycnostachyum	Blackroot	UPL	ǂ	0.1
Rhynchospora fascicularis	Fasciculate beakrush	FACW	ǂ	0.1
Sida rhombifolia	Indian hemp	UPL		0.1
Smilax auriculata	Earleaf greenbriar	-		0.1
Spartina bakeri	Sand cordgrass	FACW		0.1
Vaccinium myrsinites	Shiny blueberry	UPL		0.1
Total Cover of Species Listed in Tables			**(26)**	**32.9**

TABLE 3: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Not Listed in Tables				
Polypremum procumbens	Rustweed	FAC	ǂ	3.5
Conyza canadensis	Dwarf horseweed	UPL	ǂ	1.5
Solidago sempervirens	Seaside goldenrod	FACW		1.5
Aeschynomene americana	Meadow joint-vetch	UPL		1.2
Schizachyrium stoloniferum	Creeping little bluestem	FAC		0.8
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.6
Lythrum alatum	Winged lythrum	OBL	ǂ	0.4
Sesbania herbacea	Danglepod	FAC		0.4
Boehmeria cylindrica	Small-spike false nettle	OBL	ǂ	0.3
Cirsium nuttallii	Nuttall's thistle	FACW		0.3
Heterotheca subaxillaris	Camphorweed	UPL	ǂ	0.3
Paspalum conjugatum	Sour paspalum	FAC	ǂ	0.3
Chamaesyce hyssopifolia	Hyssopleaf sandmat	UPL	ǂ	0.2
Croton glandulosus	Vente conmigo	UPL	ǂ	0.1
Cyperus surinamensis	Tropical flatsedge	FACW	ǂ	0.1
Eclipta prostrata	Upright burhead	FACW	ǂ	0.1
Fimbristylis dichotoma	Forked fimbry	OBL	ǂ	0.1
Hypericum mutilum	Dwarf St. John's-wort	FACW	ǂ	0.1
Juncus megacephalus	Bighead rush	OBL	ǂ	0.1
Lepidium virginicum	Pepper grass	UPL	ǂ	0.1
Ludwigia octovalvis	Large seedbox	OBL	ǂ	0.1
Phytolacca americana	Common pokeweed	UPL	ǂ	0.1
Pluchea odorata	Sweetscent	FACW	ǂ	0.1
Portulaca pilosa	Pink purslane	UPL	ǂ	0.1
Smilax bona-nox	Saw greenbrier	-		0.1
Woodwardia virginica	Virginia chain fern	FACW		0.1
Total Cover of Species Not Listed in Tables			**(19)**	**12.6**
Non-Native Species				
Sporobolus indicus	Smutgrass	UPL	ǂ	6.6
Indigofera hirsuta	Hairy indigo	UPL	ǂ	3.8
Desmodium triflorum	Beggarweed	UPL	ǂ	0.4
Bulbostylis barbata	Watergrass	UPL	ǂ	0.3
Richardia brasiliensis	Richardia	UPL	ǂ	0.3
Sacciolepis indica	Glenwood grass	FAC	ǂ	0.2
Abutilon theophrasti	Velvetleaf	UPL		0.1
Crotalaria pallida	Smooth rattle-box	UPL	ǂ	0.1
Cyperus iria	Rice flatsedge	FACW	ǂ	0.1
Drymaria cordata	West Indian chickweed	FAC		0.1
Eragrostis atrovirens	Thalia lovegrass	FAC	ǂ	0.1
Oldenlandia corymbosa	Flattop mille graines	FACW		0.1
Paspalum urvillei	Vaseygrass	FAC	ǂ	0.1
Phyllanthus urinaria	Chamberbitter	FAC		0.1
Total Cover of Non-Native Species			**(10)**	**12.4**

TABLE 3: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Nuisance Species[2]				
Melinis repens	Natalgrass	UPL	ǂ	6.7
Cynodon dactylon	Bermuda grass	UPL	ǂ	2.0
Urena lobata	Caesarweed	UPL	ǂ	1.5
Spermacoce verticillata	Shrubby false buttonweed	UPL	ǂ	0.6
Imperata cylindrica	Cogon grass	UPL		0.4
Praxelis clematidea	Praxelis	UPL	ǂ	0.4
Nephrolepis cordifolia	Tuberous swordfern	FAC		0.3
Paspalum notatum	Bahia grass	UPL	ǂ	0.2
Ludwigia peruviana	Primrose willow	OBL		0.1
Macroptilium lathyroides	Phaseolus	-		0.1
Mikania scandens	Climbing hempvine	-*		0.1
Panicum repens	Torpedo grass	FACW	ǂ	0.1
Total Cover of Nuisance Species			**(7)**	**12.5**
Total Species Cover			**84**	**70.4**
Total Bare Ground/Dead Litter				**31.2**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 4: ADDITIONAL SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Amphicarpum muehlenbergianum	Blue maidencane		FACW
Baccharis halimifolia	Eastern false-willow		FAC
Centella asiatica	Asian coinwort		FACW
Crotalaria rotundifolia	Rabbitbells		UPL
Cyperus polystachyos	Manyspike flatsedge	ǂ	FACW
Elephantopus elatus	Tall elephantsfoot		UPL
Eragrostis elliottii	Elliot's lovegrass	ǂ	FAC
Froelichia floridana	Cottonweed	ǂ	UPL
Hyptis alata	Musky mint		FACW
Lachnanthes caroliniana	Carolina redroot		FAC
Opuntia humifusa	Pricklypear		UPL
Panicum hemitomon	Maidencane	ǂ	OBL
Polygonum punctatum	Dotted smartweed	ǂ	OBL
Quercus pumila	Running oak		UPL
Rhexia mariana	Meadow-beauty	ǂ	FACW
Sabal palmetto	Cabbage palm		FAC
Species Not Listed in Tables			
Acrostichum danaeifolium	Giant leather fern		OBL
Chamaesyce hirta	Pillpod sandmat	ǂ	UPL
Commelina diffusa	Dayflower	ǂ	FACW
Croton michauxii	Rushfoil	ǂ	UPL
Cyperus haspan	Haspan flatsedge	ǂ	OBL
Cyperus odoratus	Fragrant flatsedge	ǂ	FACW
Cyperus strigosus	Straw colored flatsedge	ǂ	FACW
Cyperus virens	Green flatsedge	ǂ	FACW
Echinochloa walteri	Coast cockspur	ǂ	FACW
Eragrostis spectabilis	Purple lovegrass	ǂ	FAC
Eupatorium serotinum	Late-flowering thorough-wort		FAC
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Oenothera laciniata	Cutleaf evening primrose		UPL
Panicum dichotomiflorum	Fall panicum	ǂ	FACW
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		UPL
Ptilimnium capillaceum	Bishop-weed	ǂ	FACW
Rhus copallinum	Winged sumac		UPL
Rhynchospora microcarpa	Southern beakrush	ǂ	OBL
Thelypteris kunthii	Southern shield fern		FACW
Vicia acutifolia	Four-leaf vetch		FACW

TABLE 4: ADDITIONAL SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Non-native Species			
Commelina gambiae	Gambian dayflower	ǂ	FACW
Crotalaria spectabilis	Rattle-box		UPL
Emilia fosbergii	Florida tasselflower	ǂ	UPL
Emilia sonchifolia	Tasselflower	ǂ	UPL
Hyptis verticillata	John Charles		UPL
Wahlenbergia marginata	Southern rockbell	ǂ	UPL
Nuisance Species[(2)]			
Panicum maximum	Guineagrass	ǂ	UPL
Solanum viarum	Tropical soda apple		UPL
Total Additional Species Listed in Tables		**6**	**16**
Total Additional Species Not Listed in Tables		**13**	**20**
Total Additional Non-native Species		**4**	**6**
Total Additional Nuisance Species		**1**	**2**
Total Additional Species		**24**	**44**

*Native nuisance species

[(1)] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phospate Mining Reclamation Manual

[(2)] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 5: TREE DENSITY BY SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Quercus virginiana	Live oak	UPL	5	0	5	67	9.1	173.5	0
Myrica cerifera	Wax myrtle	FAC	1	0	1	13	1.8	3.0	0
Tree Species Listed In Table Subtotals			**6**	**0**	**6**	**80**	**10.9**	**176.5**	**0**
Tree Species Not Listed in Table[1]									
Liquidambar styraciflua	Sweetgum	FACW	46	0	46	613	83.6	20.1	0
Quercus nigra	Water oak	FACW	2	0	2	27	3.6	5.2	0
Quercus laurifolia	Laurel oak	FACW	1	0	1	13	1.8	1.1	0
Tree Species Not Listed in Table Subtotals			**49**	**0**	**49**	**653**	**89.1**	**26.4**	**0**
TOTALS			**55**	**0**	**55**	**733**	**100.0**	**202.9**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Baccharis halimifolia	Eastern false-willow	FAC	2	0	2	27
Shrub Species Listed in Table Subtotals			**2**	**0**	**2**	**27**
Shrub Species Not Listed in Table						
Hypericum hypericoides	St. Andrews cross	FAC	3	0	3	40
Shrub Species Not Listed in Table Subtotals			**3**	**0**	**3**	**40**
TOTALS			**5**	**0**	**5**	**67**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 6: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Scoparia dulcis	Licorice weed	FAC	ǂ	10.8
Andropogon virginicus	Broomsedge	FAC	ǂ	10.6
Euthamia caroliniana	Slender goldenrod	FAC		2.9
Eupatorium capillifolium	Dogfennel	FAC		2.7
Axonopus fissifolius	Southern carpet grass	FAC	ǂ	2.3
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	2.1
Buchnera americana	American bluehearts	UPL	ǂ	1.9
Galactia elliotii	Milkpea	UPL		1.3
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	1.1
Solidago fistulosa	Pine-barren goldenrod	FACW		0.8
Cyperus compressus	Poorland flatsedge	FACW	ǂ	0.4
Hypericum tetrapetalum	St. John's wort	FAC	ǂ	0.4
Pterocaulon pycnostachyum	Blackroot	UPL	ǂ	0.4
Total Cover of Species Listed in Table			**(9)**	**37.7**
Species Not Listed in Table				
Quercus nigra	Water oak	UPL		5.5
Gelsemium sempervirens	Yellow jessamine	-		4.5
Dichanthelium acuminatum	Panic grass	FACW		1.9
Polypremum procumbens	Rustweed	FAC	ǂ	1.9
Hypericum hypericoides	St. Andrews cross	FAC	ǂ	1.3
Liquidambar styraciflua	Sweetgum	FACW		0.8
Parthenocissus quinquefolia	Virginia creeper	-		0.7
Acer rubrum	Red maple	FACW		0.4
Cirsium nuttallii	Nuttall's thistle	FACW		0.4
Conyza canadensis	Dwarf horseweed	UPL	ǂ	0.4
Rubus argutus	Sawtooth blackberry	FAC		0.4
Smilax bona-nox	Saw greenbrier	-		0.4
Total Cover of Species Not Listed in Table			**(3)**	**18.6**
Non-native Species				
Indigofera hirsuta	Hairy indigo	UPL	ǂ	3.5
Sporobolus indicus	Smutgrass	UPL	ǂ	1.3
Total Cover of Non-native Species			**(2)**	**4.8**
Nuisance Species[2]				
Urena lobata	Caesarweed	UPL	ǂ	22.0
Paspalum notatum	Bahia grass	UPL	ǂ	3.5
Panicum maximum	Guineagrass	UPL	ǂ	0.4
Total Cover of Nuisance Species			**(3)**	**25.9**
Total Species Cover			**17**	**87.0**
Total Bare Ground/Dead Litter				**13.0**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 7: ADDITIONAL SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table[1]			
Desmodium incanum	Zarzabacao comun	ǂ	UPL
Juncus marginatus	Grassleaf rush	ǂ	FACW
Juncus scirpoides	Needlepod rush	ǂ	OBL
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Panicum hemitomon	Maidencane		OBL
Pinus elliottii	Slash pine		UPL
Serenoa repens	Saw palmetto	ǂ	UPL
Species Not Listed in Table			
Agalinus purpurea	Large purple false-foxglove	ǂ	FACW
Ampelopsis arborea	Pepper-vine		-
Callicarpa americana	American beauty-berry		UPL
Cyperus strigosus	Straw colored flatsedge	ǂ	FACW
Diospyros virginiana	Persimmon		FAC
Juncus effusus	Softrush	ǂ	OBL
Paspalum conjugatum	Sour paspalum	ǂ	FAC
Tillandsia usneoides	Spanish moss		UPL
Vitis rotundifolia	Muscadine grape		-
Non-native Species			
Abutilon theophrasti	Velvetleaf		UPL
Drymaria cordata	West Indian chickweed		FAC
Nuisance Species[2]			
Lygodium japonicum	Japanese climbing fern		-
Praxelis clematidea	Praxelis	ǂ	UPL
Total Additional Species Listed in Tables		**5**	**7**
Total Additional Species Not Listed in Tables		**4**	**9**
Total Additional Non-native Species		**0**	**2**
Total Additional Nuisance Species		**1**	**2**
Total Additional Species		**10**	**20**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 8: TREE DENSITY BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Quercus virginiana	Live oak	UPL	1	0	1	4	14.3	<0.05	0
Tree Species Listed In Table Subtotals			**1**	**0**	**1**	**4**	**14.3**	**0.0**	**0**
Tree Species Not Listed in Table									
Diospyros virginiana	Persimmon	FAC	3	0	3	12	42.9	0.2	0
Quercus laevis	Turkey oak	UPL	2	0	2	8	28.6	0.1	0
Quercus geminata	Sand live oak	UPL	1	0	1	4	14.3	0.1	0
Tree Species Not Listed in Table Subtotals			**6**	**0**	**6**	**24**	**85.7**	**0.4**	**0**
TOTALS			**7**	**0**	**7**	**28**	**100.0**	**0.4**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	147	0	147	588
Asimina obovata	Bigflower pawpaw	UPL	5	0	5	20
Quercus myrtifolia	Myrtle oak	UPL	5	0	5	20
Baccharis halimifolia	Eastern false-willow	FAC	4	0	4	16
Ilex glabra	Gallberry	UPL	4	0	4	16
Hypericum hypericoides	St. Andrews cross	FAC	1	0	1	4
Quercus minima	Dwarf live oak	UPL	1	0	1	4
Quercus pumila	Running oak	UPL	1	0	1	4
Shrub Species Listed in Table Subtotals			**168**	**0**	**168**	**672**
Shrub Species Not Listed in Table						
Rhus copallinum	Winged sumac	UPL	31	0	31	124
Shrub Species Not Listed in Table Subtotals			**31**	**0**	**31**	**124**
TOTALS			**199**	**0**	**199**	**796**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 9: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables(1)				
Serenoa repens	Saw palmetto	UPL	ǂ	20.7
Euthamia caroliniana	Slender goldenrod	FAC		7.1
Aristida stricta	Wiregrass	FAC		6.5
Galactia elliotii	Milkpea	UPL		6.0
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	4.6
Andropogon virginicus	Broomsedge	FAC	ǂ	4.5
Quercus pumila	Running oak	UPL		3.8
Lechea torreyi	Piedmont pinweed	UPL	ǂ	1.8
Vaccinium myrsinites	Shiny blueberry	UPL		1.4
Licania michauxii	Gopher apple	UPL		1.1
Solidago fistulosa	Pine-barren goldenrod	FACW		1.0
Pterocaulon pycnostachyum	Blackroot	UPL	ǂ	0.9
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.8
Stillingia sylvatica	Queensdelight	FAC		0.8
Eragrostis elliottii	Elliot's lovegrass	FAC	ǂ	0.6
Opuntia humifusa	Pricklypear	UPL		0.5
Aristida spiciformis	Pinebarren three-awn	FAC		0.4
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.4
Elephantopus elatus	Tall elephantsfoot	UPL		0.4
Euphorbia polyphylla	Lesser florida spurge	FACW		0.4
Froelichia floridana	Cottonweed	UPL	ǂ	0.4
Quercus myrtifolia	Myrtle oak	UPL		0.4
Smilax auriculata	Earleaf greenbriar	-		0.4
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.3
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	0.3
Scoparia dulcis	Licorice weed	FAC	ǂ	0.3
Digitaria serotina	Hairy crabgrass	FAC		0.1
Diodia virginiana	Rough button-weed	FACW	ǂ	0.1
Eupatorium rotundifolium	False hoarhound	FAC		0.1
Hyptis alata	Musky mint	FACW		0.1
Juncus scirpoides	Needlepod rush	OBL	ǂ	0.1
Paspalum setaceum	Thin paspalum	FAC		0.1
Piloblephis rigida	Wild pennyroyal	UPL	ǂ	0.1
Total Cover of Species Listed in Tables			**(15)**	**66.5**

TABLE 9: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Not Listed in Table				
Croton michauxii	Rushfoil	UPL	ǂ	1.5
Rhus copallinum	Winged sumac	UPL		1.1
Saccharum giganteum	Sugarcane plumegrass	OBL		1.0
Schizachyrium stoloniferum	Creeping little bluestem	FAC		0.9
Vaccinium stamineum	Deerberry	UPL		0.6
Polypremum procumbens	Rustweed	FAC	ǂ	0.5
Rubus argutus	Sawtooth blackberry	FAC		0.5
Vitis rotundifolia	Muscadine grape	-		0.5
Diospyros virginiana	Persimmon	FAC		0.3
Woodwardia virginica	Virginia chain fern	FACW		0.3
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.3
Conyza canadensis	Dwarf horseweed	UPL	ǂ	0.1
Dichanthelium acuminatum	Panic grass	FACW		0.1
Lechea deckertii	Deckert's pinweed	-	ǂ	0.1
Pteridium aquilinum var. pseudocaudatum	Tailed bracken	UPL		0.1
Smilax bona-nox	Saw greenbrier	-		0.1
Total Cover of Species Not Listed in Table			**(5)**	**8.0**
Non-native Species				
Bulbostylis barbata	Watergrass	UPL	ǂ	0.3
Total Cover of Non-native Species			**(1)**	**0.3**
Nuisance Species[2]				
Imperata cylindrica	Cogon grass	UPL		1.0
Urena lobata	Caesarweed	UPL	ǂ	0.8
Total Cover of Nuisance Species			**(1)**	**1.8**
Total Species Cover			**22**	**76.6**
Total Bare Ground/Dead Litter				**24.3**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 10: ADDITIONAL SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table[1]			
Ambrosia artemisiifolia	Common ragweed		UPL
Buchnera americana	American bluehearts		UPL
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Erechtites hieraciifolius	Fireweed		FAC
Eupatorium capillifolium	Dogfennel		FAC
Eupatorium mohrii	Eupatorium		FAC
Helianthemum corymbosum	Pinebarren frostweed	ǂ	UPL
Hypericum tetrapetalum	St. John's wort	ǂ	FAC
Juncus marginatus	Grassleaf rush	ǂ	FACW
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Panicum hemitomon	Maidencane		OBL
Polgyala rugelii	Yellow milwort	ǂ	FACW
Rhexia mariana	Meadow-beauty	ǂ	FACW
Solidago odorata var. chapmanii	Chapman's goldenrod		UPL
Species Not Listed in Table			
Aeschynomene americana	Meadow joint-vetch		UPL
Callicarpa americana	American beauty-berry		UPL
Chrysopsis subulata	Scrubland goldenaster	ǂ	UPL
Cirsium nuttallii	Nuttall's thistle		FACW
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Indigofera caroliniana	Carolina indigo	ǂ	UPL
Lepidium virginicum	Pepper grass	ǂ	UPL
Lycopodiella cernua	Nodding clubmoss		FACW
Phytolacca americana	Common pokeweed		UPL
Thelypteris kunthii	Southern shield fern		FACW
Nuisance Species[2]			
Paspalum notatum	Bahia grass	ǂ	UPL
Total Additional Species Listed in Tables		**7**	**14**
Total Additional Species Not Listed in Tables		**4**	**10**
Total Additional Nuisance Species		**1**	**1**
Total Additional Species		**12**	**25**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 11: TREE DENSITY BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Pinus elliottii	Slash pine	UPL	51	3	54	108	59.3	0.4	3
Quercus virginiana	Live oak	UPL	15	2	17	34	18.7	2.3	3
Myrica cerifera	Wax myrtle	FAC	12	0	12	24	13.2	7.0	5
Quercus laurifolia	Laurel oak	FACW	4	1	5	10	5.5	0.1	0
Liquidambar styraciflua	Sweetgum	FACW	1	0	1	2	1.1	44.6	0
Tree Species Listed In Table Subtotals			**83**	**6**	**89**	**178**	**97.8**	**54.4**	**11**
Tree Species Not Listed in Table									
Pinus clausa	Sand pine	UPL	0	2	2	4	2.2	2.4	0
Tree Species Not Listed in Table Subtotals			**0**	**2**	**2**	**4**	**2.2**	**2.4**	**0**
TOTALS			**83**	**8**	**91**	**182**	**100.0**	**56.8**	**11**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	23	0	23	46
Hypericum hypericoides	St. Andrews cross	FAC	4	0	4	8
Baccharis halimifolia	Eastern false-willow	FAC	1	0	1	2
TOTALS			**28**	**0**	**28**	**56**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 12: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Eupatorium capillifolium	Dogfennel	FAC		2.5
Ptilimnium capillaceum	Bishop-weed	FACW	ǂ	1.8
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	1.6
Coreopsis leavenworthii	Leavenworth's tickseed	FACW	ǂ	1.5
Oxalis corniculata	Yellow wood sorrel	UPL	ǂ	1.4
Scoparia dulcis	Licorice weed	FAC	ǂ	1.4
Axonopus fissifolius	Southern carpet grass	FAC	ǂ	1.2
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	1.2
Euthamia caroliniana	Slender goldenrod	FAC		1.2
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	1.1
Desmodium incanum	Zarzabacao comun	UPL	ǂ	0.9
Centella asiatica	Asian coinwort	FACW		0.8
Paspalum setaceum	Thin paspalum	FAC	ǂ	0.8
Ambrosia artemisiifolia	Common ragweed	UPL		0.6
Ludwigia repens	Red-leaf ludwigia	OBL		0.6
Panicum hemitomon	Maidencane	OBL		0.6
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	0.6
Andropogon virginicus	Broomsedge	FAC	ǂ	0.5
Chamaecrista nictitans	Wild sensitive plant	UPL		0.5
Digitaria ciliaris	Southern crabgrass	UPL	ǂ	0.5
Lythrum alatum	Winged lythrum	OBL	ǂ	0.4
Digitaria serotina	Hairy crabgrass	FAC	ǂ	0.3
Rubus argutus	Sawtooth blackberry	FAC		0.3
Serenoa repens	Saw palmetto	UPL	ǂ	0.3
Bidens alba (synonym B. pilosa)	White beggar-ticks	FAC	ǂ	0.2
Crotalaria rotundifolia	Rabbitbells	UPL	ǂ	0.2
Eustachys glauca	Saltmarsh fingergrass	FACW	ǂ	0.2
Juncus marginatus	Grassleaf rush	FACW	ǂ	0.2
Juncus scirpoides	Needlepod rush	OBL	ǂ	0.2
Solidago fistulosa	Pine-barren goldenrod	FACW		0.2
Baccharis halimifolia	Eastern false-willow	FAC		0.1
Croton michauxii	Rushfoil	UPL	ǂ	0.1
Cyperus surinamensis	Tropical flatsedge	FACW	ǂ	0.1
Erechtites hieraciifolius	Fireweed	FAC	ǂ	0.1
Galactia elliotii	Milkpea	UPL		0.1
Hypericum hypericoides	St. Andrews cross	FAC	ǂ	0.1
Hypericum mutilum	Dwarf St. John's-wort	FACW	ǂ	0.1

TABLE 12: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables(1) (continued)				
Juncus megacephalus	Bighead rush	OBL	ǂ	0.1
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.1
Oldenlandia uniflora	Clustered millie graines	FACW	ǂ	0.1
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	0.1
Polygonum punctatum	Dotted smartweed	OBL	ǂ	0.1
Pterocaulon pycnostachyum	Blackroot	UPL	ǂ	0.1
Quercus virginiana	Live oak	UPL		0.1
Sesbania herbacea	Danglepod	FAC		0.1
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.1
Total Cover of Species Listed in Table			**(33)**	**25.4**
Species Not Listed in Table				
Conyza canadensis	Dwarf horseweed	UPL	ǂ	6.6
Polypremum procumbens	Rustweed	FAC	ǂ	1.8
Cirsium nuttallii	Nuttall's thistle	FACW		1.4
Aeschynomene americana	Meadow joint-vetch	UPL		0.9
Dichanthelium acuminatum	Panic grass	FACW	ǂ	0.4
Lepidium virginicum	Pepper grass	UPL	ǂ	0.4
Chamaesyce hyssopifolia	Hyssopleaf sandmat	UPL		0.3
Erigeron quercifolius	Oak-leaf fleabane	FAC		0.3
Ludwigia octovalvis	Large seedbox	OBL	ǂ	0.3
Chamaesyce hirta	Pillpod sandmat	UPL		0.2
Cyperus virens	Green flatsedge	FACW	ǂ	0.2
Mikania scandens	Climbing hempvine	-		0.2
Commelina diffusa	Dayflower	FACW	ǂ	0.1
Fimbristylis dichotoma	Forked fimbry	OBL	ǂ	0.1
Paspalum conjugatum	Sour paspalum	FAC	ǂ	0.1
Phytolacca americana	Common pokeweed	UPL	ǂ	0.1
Pluchea baccharis	Rosy camphorweed	FACW	ǂ	0.1
Pluchea odorata	Sweetscent	FACW	ǂ	0.1
Smilax bona-nox	Saw greenbrier	-		0.1
Total Cover of Species Not Listed in Table			**(13)**	**13.7**

TABLE 12: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Non-Native Species				
Desmodium triflorum	Beggarweed	UPL	ǂ	3.3
Indigofera hirsuta	Hairy indigo	UPL	ǂ	3.2
Crotalaria pallida	Smooth rattle-box	UPL	ǂ	1.3
Abutilon theophrasti	Velvetleaf	UPL		1.2
Richardia brasiliensis	Richardia	UPL	ǂ	0.9
Sporobolus indicus	Smutgrass	UPL	ǂ	0.7
Wahlenbergia marginata	Southern rockbell	UPL	ǂ	0.7
Digitaria longiflora	Indian crabgrass	UPL	ǂ	0.5
Sacciolepis indica	Glenwood grass	FAC	ǂ	0.3
Drymaria cordata	West Indian chickweed	FAC		0.2
Hyptis verticillata	John Charles	UPL		0.2
Emilia sonchifolia	Tasselflower	UPL	ǂ	0.1
Kyllinga brevifolia	Shortleaf spikesedge	FACW	ǂ	0.1
Total Cover of Non-Native Species			**(10)**	**12.7**
Nuisance Species[2]				
Paspalum notatum	Bahia grass	UPL	ǂ	11.7
Urena lobata	Caesarweed	UPL	ǂ	4.6
Melinis repens	Natalgrass	UPL	ǂ	2.2
Imperata cylindrica	Cogon grass	UPL		1.7
Spermacoce verticillata	Shrubby false buttonweed	UPL	ǂ	1.1
Cynodon dactylon	Bermuda grass	UPL	ǂ	0.7
Solanum viarum	Tropical soda apple	UPL		0.3
Macroptilium lathyroides	Phaseolus	-		0.2
Panicum repens	Torpedo grass	FACW	ǂ	0.1
Praxelis clematidea	Praxelis	UPL	ǂ	0.1
Total Cover of Nuisance Species			**(7)**	**22.7**
Total Species Cover			**62**	**74.5**
Total Bare Ground/Dead Litter				**26.2**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 13: ADDITIONAL SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table[1]			
Aristida stricta	Wiregrass		FAC
Buchnera americana	American bluehearts	ǂ	UPL
Callicarpa americana	American beauty-berry		UPL
Carex longii	Long's sedge	ǂ	FACW
Cyperus strigosus	Straw colored flatsedge	ǂ	FACW
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Hypericum tetrapetalum	St. John's wort	ǂ	FAC
Phyla nodiflora	Frog-fruit	ǂ	FAC
Rubus cuneifolius	Sand Blackberry		FAC
Sida rhombifolia	Indian hemp		UPL
Tillandsia usneoides	Spanish moss		UPL
Species Not Listed in Table			
Ampelopsis arborea	Pepper-vine		-
Asimina obovata	Bigflower pawpaw		-
Eupatorium serotinum	Late-flowering thorough-wort		FAC
Melothria pendula	Creeping cucumber		-
Parthenocissus quinquefolia	Virginia creeper		-
Portulaca pilosa	Pink purslane	ǂ	UPL
Rumex hastatulus	Dock		FACW
Solidago sempervirens	Seaside goldenrod		FACW
Symphyotrichum bahamense	Annual saltmarsh aster		OBL
Non-native Species			
Crotalaria spectabilis	Rattle-box	ǂ	UPL
Cuphea carthagenensis	Columbian waxweed		FAC
Total Additional Species Listed in Tables		**5**	**11**
Total Additional Species Not Listed in Tables		**1**	**9**
Total Additional Non-native Species		**1**	**2**
Total Additional Species		**7**	**22**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

ǂ Observation of fruit or flowering body

TABLE 14: TREE DENSITY BY SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Pinus elliottii	Slash pine	UPL	13	0	13	173	76.5	35.2	0
Myrica cerifera	Wax myrtle	FAC	3	0	3	40	17.7	5.7	0
Quercus virginiana	Live oak	UPL	1	0	1	13	5.9	3.5	0
TOTALS			**17**	**0**	**17**	**226**	**100.0**	**44.4**	**0**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 15: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Andropogon virginicus	Broomsedge	FAC	ǂ	10.1
Euthamia caroliniana	Slender goldenrod	FAC		9.3
Rhynchospora fascicularis	Fasciculate beakrush	FACW	ǂ	5.5
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	4.2
Panicum hemitomon	Maidencane	OBL		3.8
Juncus marginatus	Grassleaf rush	FACW	ǂ	3.4
Solidago fistulosa	Pine-barren goldenrod	FACW		2.9
Centella asiatica	Asian coinwort	FACW		2.1
Scoparia dulcis	Licorice weed	FAC	ǂ	1.5
Helianthus angustifolius	Narrowleaf sunflower	FACW	ǂ	0.9
Helianthus radula	Rayless sunflower	UPL		0.8
Rhexia mariana	Meadow-beauty	FACW	ǂ	0.8
Oxalis corniculata	Yellow wood sorrel	UPL	ǂ	0.6
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.4
Hypericum tetrapetalum	St. John's wort	FAC		0.4
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.4
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.2
Total Cover of Species Listed in Table			**(11)**	**47.3**
Species Not Listed in Table				
Paspalum conjugatum	Sour paspalum	FAC	ǂ	1.7
Dichanthelium acuminatum	Panic grass	FACW	ǂ	1.5
Polypremum procumbens	Rustweed	FAC	ǂ	1.2
Cirsium nuttallii	Nuttall's thistle	FACW		0.9
Total Cover of Species Not Listed in Table			**(3)**	**5.3**
Non-native Species				
Indigofera hirsuta	Hairy indigo	UPL	ǂ	1.9
Total Cover of Non-native Species			**(1)**	**1.9**
Nuisance Species[2]				
Paspalum notatum	Bahia grass	UPL	ǂ	27.1
Urena lobata	Caesarweed	UPL	ǂ	1.4
Total Cover of Nuisance Species			**(2)**	**28.5**
Total Species Cover			**21**	**83.0**
Total Bare Ground/Dead Litter				**17.0**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 16: ADDITIONAL SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table(1)			
Acer rubrum	Red maple		FACW
Aristida stricta	Wiregrass		FAC
Bidens alba (synonym B. pilosa)	White beggar-ticks	‡	FAC
Buchnera americana	American bluehearts	‡	UPL
Carex longii	Long's sedge	‡	FACW
Coreopsis leavenworthii	Leavenworth's tickseed	‡	FACW
Crotalaria rotundifolia	Rabbitbells	‡	UPL
Erechtites hieraciifolius	Fireweed		FAC
Eupatorium capillifolium	Dogfennel		FAC
Galactia elliotii	Milkpea		UPL
Gelsemium sempervirens	Yellow jessamine		-
Hyptis alata	Musky mint		FACW
Juncus scirpoides	Needlepod rush	‡	OBL
Panicum rigidulum	Red-top panic grass	‡	FACW
Pterocaulon pycnostachyum	Blackroot		UPL
Ptilimnium capillaceum	Bishop-weed	‡	FACW
Quercus nigra	Water oak		UPL
Rhus copallinum	Winged sumac		UPL
Setaria parviflora	Knotroot bristle grass	‡	FAC
Spartina bakeri	Sand cordgrass		FACW
Tillandsia usneoides	Spanish moss		UPL
Xyris sp.	Yellow-eyed grass	‡	OBL
Elephantopus elatus	Tall elephantsfoot		UPL
Species Not Listed in Table			
Aeschynomene americana	Meadow joint-vetch		UPL
Boehmeria cylindrica	Small-spike false nettle		OBL
Magnolia virginiana	Sweetbay		OBL
Parthenocissus quinquefolia	Virginia creeper		-
Pluchea odorata	Sweetscent	‡	FACW
Sagittaria lancifolia	Bulltongue arrowhead	‡	OBL
Smilax bona-nox	Saw greenbrier		-
Solidago sempervirens	Seaside goldenrod		FACW
Tripsacum dactyloides	Fakahatchee grass		FAC
Vigna luteola	Hairypod cowpea		-
Viburnum obovatum	Walter's viburnum		FACW
Woodwardia virginica	Virginia chain fern		FACW

TABLE 16: ADDITIONAL SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Non-native Species			
Drymaria cordata	West Indian chickweed		FAC
Nuisance Species[(2)]			
Imperata cylindrica	Cogon grass		UPL
Total Additional Species Listed in Tables		**10**	**23**
Total Additional Species Not Listed in Tables		**2**	**12**
Total Additional Non-native Species		**0**	**1**
Total Additional Nuisance Species		**0**	**1**
Total Additional Species		**12**	**37**

[(1)] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[(2)] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 17: TREE DENSITY BY SPECIES - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	26	0	26	260	70.3	29.9	0
Quercus virginiana	Live oak	UPL	4	0	4	40	10.8	18.5	0
Pinus elliottii	Slash pine	UPL	1	0	1	10	2.7	0.7	0
Quercus laurifolia	Laurel oak	FACW	1	0	1	10	2.7	0.4	0
Tree Species Listed In Table Subtotals			**32**	**0**	**32**	**320**	**86.5**	**49.5**	**0**
Tree Species Not Listed in Table									
Persea borbonia	Red bay	UPL	5	0	5	50	13.5	7.9	0
Tree Species Not Listed in Table Subtotals			**5**	**0**	**5**	**50**	**13.5**	**7.9**	**0**
TOTALS			**37**	**0**	**37**	**370**	**100.0**	**57.4**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Vaccinium stamineum	Deerberry	UPL	39	0	39	390
Ilex glabra	Gallberry	UPL	20	0	20	200
Baccharis halimifolia	Eastern false-willow	FAC	16	0	16	160
Serenoa repens	Saw palmetto	UPL	13	0	13	130
Rhus copallinum	Winged sumac	UPL	1	0	1	5
Shrub Species Listed in Table Subtotals			**89**	**0**	**89**	**885**
Shrub Species Not Listed in Table						
Asimina obovata	Large flowered pawpaw	UPL	30	0	30	300
Vaccinium corymbosum	Highbush blueberry	FACW	9	0	9	41
Shrub Species Not Listed in Table Subtotals			**39**	**0**	**39**	**341**
TOTALS			**128**	**0**	**128**	**1226**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 18: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Andropogon virginicus	Broomsedge	FAC	‡	14.4
Solidago fistulosa	Pine-barren goldenrod	FACW		11.6
Andropogon glomeratus	Bushy bluestem	FACW	‡	9.6
Xyris sp.	Yellow-eyed grass	OBL	‡	8.8
Vaccinium stamineum	Deerberry	UPL		7.5
Vitis rotundifolia	Muscadine grape	-		6.0
Ilex glabra	Gallberry	UPL		5.1
Serenoa repens	Saw palmetto	UPL	‡	4.7
Myrica cerifera	Wax myrtle	FAC		1.3
Rhynchospora fascicularis	Fasciculate beakrush	FACW	‡	1.3
Baccharis halimifolia	Eastern false-willow	FAC		0.9
Eupatorium capillifolium	Dogfennel	FAC		0.9
Lythrum alatum	Winged lythrum	OBL	‡	0.9
Hypericum cistifolium	Round-pod St. John's wort	FACW	‡	0.6
Polygonum punctatum	Dotted smartweed	OBL	‡	0.6
Euthamia caroliniana	Slender goldenrod	FAC		0.3
Total Cover of Species Listed in Table			**(8)**	**74.5**
Species Not Listed in Table				
Woodwardia virginica	Virginia chain fern	FACW		11.8
Osmunda cinnamomea	Cinnamon fern	FACW		1.7
Asimina obovata	Bigflower pawpaw	-		0.9
Eupatorium serotinum	Late-flowering thorough-wort	FAC		0.9
Eriocaulon decangulare	Ten-angle pipewort	OBL	‡	0.3
Mikania scandens	Climbing hempvine	-		0.3
Total Cover of Species Not Listed in Table			**(1)**	**15.9**
Total Species Cover			**9**	**90.4**
Total Bare Ground/Dead Litter				**9.6**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

‡ Observation of fruit or flowering body

TABLE 19: ADDITIONAL SPECIES - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table[1]			
Centella asiatica	Asian coinwort		FACW
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Cyperus retrorsus	Pinebarren flatsedge	ǂ	FAC
Galactia elliotii	Milkpea		UPL
Hypericum tetrapetalum	St. John's wort	ǂ	FAC
Juncus effusus	Softrush	ǂ	OBL
Juncus marginatus	Grassleaf rush	ǂ	FACW
Juncus megacephalus	Bighead rush	ǂ	OBL
Juncus scirpoides	Needlepod rush	ǂ	OBL
Polgyala rugelii	Yellow milwort	ǂ	FACW
Rhexia mariana	Meadow-beauty	ǂ	FACW
Setaria parviflora	Knotroot bristle grass	ǂ	FAC
Smilax auriculata	Earleaf greenbriar		-
Syngonanthus flavidulus	Bantam-buttons	ǂ	FACW
Species Not Listed in Table			
Ludwigia octovalvis	Large seedbox	ǂ	OBL
Osmunda regalis	Royal fern		OBL
Smilax bona-nox	Saw greenbrier		-
Nuisance Species[2]			
Urena lobata	Caesarweed	ǂ	UPL
Total Additional Species Listed in Tables		**11**	**14**
Total Additional Species Not Listed in Tables		**1**	**3**
Total Additional Nuisance Species		**1**	**1**
Total Additional Species		**13**	**18**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 20: TREE DENSITY BY SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	18	0	18	103	56.3	0.6	0
Pinus elliottii	Slash pine	UPL	6	2	8	46	25.0	22.1	0
Quercus virginiana	Live oak	UPL	4	0	4	23	12.5	7.6	0
Quercus laurifolia	Laurel oak	FACW	1	0	1	6	3.1	1.1	0
Tree Species Listed In Table Subtotals			**29**	**2**	**31**	**178**	**96.9**	**31.4**	**0**
Tree Species Not Listed in Table									
Persea palustris	Swamp bay	OBL	1	0	1	6	3.1	<0.05	0
Tree Species Not Listed in Table Subtotals			**1**	**0**	**1**	**6**	**3.1**	**0.0**	**0**
TOTAL			**30**	**2**	**32**	**184**	**100.0**	**31.4**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	2	0	2	11
TOTAL			**2**	**0**	**2**	**11**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 21: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables(1)				
Digitaria ciliaris	Southern crabgrass	UPL	ǂ	9.6
Galactia elliotii	Milkpea	UPL		7.5
Andropogon virginicus	Broomsedge	FAC	ǂ	6.2
Bidens alba (synonym B. pilosa)	White beggar-ticks	FAC	ǂ	2.1
Eupatorium capillifolium	Dogfennel	FAC		2.1
Scoparia dulcis	Licorice weed	FAC	ǂ	1.9
Thelypteris kunthii	Southern shield fern	FACW		1.5
Ambrosia artemisiifolia	Common ragweed	UPL		0.9
Centella asiatica	Asian coinwort	FACW		0.6
Myrica cerifera	Wax myrtle	FAC		0.5
Panicum hemitomon	Maidencane	OBL		0.4
Ptilimnium capillaceum	Bishop-weed	FACW	ǂ	0.3
Digitaria serotina	Hairy crabgrass	FAC	ǂ	0.2
Paspalum setaceum	Thin paspalum	FAC		0.2
Commelina diffusa	Dayflower	FACW	ǂ	0.1
Desmodium incanum	Zarzabacao comun	UPL	ǂ	0.1
Total Cover of Species Listed in Table			**(8)**	**34.2**
Species Not Listed in Table				
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	3.9
Coreopsis leavenworthii	Leavenworth's tickseed	FACW	ǂ	3.4
Lythrum alatum	Winged lythrum	OBL		1.6
Juncus scirpoides	Needlepod rush	OBL	ǂ	1.5
Juncus marginatus	Grassleaf rush	FACW	ǂ	0.8
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	0.6
Rhynchospora fascicularis	Fasciculate beakrush	FACW	ǂ	0.5
Cyperus haspan	Haspan flatsedge	OBL	ǂ	0.2
Euthamia caroliniana	Slender goldenrod	FAC		0.2
Sesbania herbacea	Danglepod	FAC		0.2
Aeschynomene americana	Meadow joint-vetch	UPL		0.7
Chamaesyce hyssopifolia	Hyssopleaf sandmat	UPL	ǂ	0.4
Conyza canadensis	Dwarf horseweed	UPL	ǂ	0.2
Portulaca pilosa	Pink purslane	UPL	ǂ	0.2
Solidago sempervirens	Seaside goldenrod	FACW		0.9
Woodwardia virginica	Virginia chain fern	FACW		0.2
Polypremum procumbens	Rustweed	FAC	ǂ	0.5
Total Cover of Species Not Listed in Table			**(11)**	**16.0**

TABLE 21: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Non-native Species				
Alysicarpus ovalifolius	False moneywort	UPL	ǂ	5.5
Indigofera hirsuta	Hairy indigo	UPL	ǂ	3.4
Paspalum urvillei	Vaseygrass	FAC	ǂ	2.0
Cyperus rotundus	Nutgrass	FAC	ǂ	1.8
Mollugo verticillata	Green carpetweed	UPL		1.6
Bulbostylis barbata	Watergrass	UPL	ǂ	1.1
Crotalaria pallida	Smooth rattle-box	UPL	ǂ	0.6
Richardia brasiliensis	Richardia	UPL		0.4
Total Cover of Non-native Species			**(6)**	**16.4**
Nuisance Species[(2)]				
Urena lobata	Caesarweed	UPL	ǂ	4.9
Cynodon dactylon	Bermuda grass	UPL	ǂ	3.2
Melinis repens	Natalgrass	UPL	ǂ	1.8
Imperata cylindrica	Cogon grass	UPL		0.9
Lygodium japonicum	Japanese climbing fern	-		0.5
Paspalum notatum	Bahia grass	UPL	ǂ	0.4
Spermacoce verticillata	Shrubby false buttonweed	UPL	ǂ	0.3
Total Cover of Nuisance Species			**(5)**	**12.0**
Total Species Cover			**30**	**78.6**
Total Bare Ground/Dead Litter				**21.8**

[(1)] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[(2)] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 22: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table[1]			
Cyperus croceus	Baldwin flatsedge	ǂ	FAC
Cyperus retrorsus	Pinebarren flatsedge	ǂ	FAC
Erigeron quercifolius	Oak-leaf fleabane	ǂ	FAC
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Oxalis corniculata	Yellow wood sorrel	ǂ	UPL
Persea borbonia	Red bay		UPL
Rubus argutus	Sawtooth blackberry		FAC
Solidago fistulosa	Pine-barren goldenrod		FACW
Tillandsia usneoides	Spanish moss		UPL
Species Not Listed in Table			
Agalinis fasciculata	Beach False-foxglove	ǂ	FACW
Cirsium nuttallii	Nuttall's thistle	ǂ	FACW
Lepidium virginicum	Pepper grass	ǂ	UPL
Oenothera laciniata	Cutleaf evening primrose		UPL
Phytolacca americana	Common pokeweed	ǂ	UPL
Pterocaulon pycnostachyum	Blackroot		UPL
Xyris sp.	Yellow-eyed grass	ǂ	OBL
Non-native Species			
Commelina gambiae	Gambian dayflower	ǂ	FACW
Hyptis verticillata	John Charles		UPL
Phyllanthus urinaria	Chamberbitter		FAC
Sporobolus indicus	Smutgrass	ǂ	UPL
Wahlenbergia marginata	Southern rockbell	ǂ	UPL
Nuisance Species[2]			
Panicum maximum	Guineagrass	ǂ	UPL
Solanum viarum	Tropical soda apple		UPL
Total Additional Species Listed in Tables		**4**	**9**
Total Additional Species Not Listed in Tables		**5**	**7**
Total Additional Non-native Species		**3**	**5**
Total Additional Nuisance Species		**1**	**2**
Total Additional Species		**13**	**23**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 23: TREE DENSITY BY SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Liquidambar styraciflua	Sweetgum	FACW	27	0	27	360	56.3	15.3	0
Quercus laurifolia	Laurel oak	FACW	10	0	10	133	20.8	66.0	0
Quercus nigra	Water oak	FACW	5	0	5	67	10.4	0.3	0
Myrica cerifera	Wax myrtle	FAC	1	0	1	13	2.1	0.4	0
Pinus elliottii	Slash pine	UPL	1	0	1	13	2.1	0.0	0
Quercus virginiana	Live oak	UPL	1	0	1	13	2.1	0.0	0
Tree Species Listed In Table Subtotals			**45**	**0**	**45**	**599**	**93.7**	**82.0**	**0**
Tree Species Not Listed in Table									
Magnolia virginiana	Sweetbay	OBL	2	0	2	27	4.2	0.1	0
Pinus palustris	Longleaf pine	UPL	1	0	1	13	2.1	8.7	0
Tree Species Not Listed in Table Subtotals			**3**	**0**	**3**	**40**	**6.3**	**8.8**	**0**
TOTAL			**48**	**0**	**48**	**639**	**100.0**	**90.8**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Baccharis halimifolia	Eastern false-willow	FAC	1	0	1	13
TOTALS			**1**	**0**	**1**	**13**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 24: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Smilax bona-nox	Saw greenbrier	-		11.1
Gelsemium sempervirens	Yellow jessamine	-		7.5
Vitis rotundifolia	Muscadine grape	-		4.9
Andropogon virginicus	Broomsedge	FAC	ǂ	3.0
Liquidambar styraciflua	Sweetgum	FACW		1.5
Elephantopus elatus	Tall elephantsfoot	UPL		1.2
Parthenocissus quinquefolia	Virginia creeper	-		0.7
Paspalum conjugatum	Sour paspalum	FAC	ǂ	0.4
Pinus elliottii	Slash pine	UPL		0.4
Quercus laurifolia	Laurel oak	FACW		0.4
Smilax auriculata	Earleaf greenbriar	-		0.4
Solidago fistulosa	Pine-barren goldenrod	FACW	ǂ	0.4
Toxicodendron radicans	Poison ivy	-		0.4
Acer rubrum	Red maple	FACW		0.3
Total Cover of Species Listed in Table			**(3)**	**32.6**
Species Not Listed in Table				
Rhynchospora fascicularis	Fasciculate beakrush	FACW	ǂ	2.1
Dichanthelium acuminatum	Panic grass	FACW	ǂ	1.8
Woodwardia virginica	Virginia chain fern	FACW		0.8
Magnolia virginiana	Sweetbay	OBL		0.3
Total Cover of Species Not Listed in Table			**(2)**	**5.0**
Nuisance Species[2]				
Paspalum notatum	Bahia grass	UPL	ǂ	1.1
Urena lobata	Caesarweed	UPL	ǂ	0.7
Total Cover of Nuisance Species			**(2)**	**1.8**
Total Species Cover			**7**	**39.4**
Total Bare Ground/Dead Litter				**60.6**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 25: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table(1)			
Ambrosia artemisiifolia	Common ragweed		UPL
Callicarpa americana	American beauty-berry		UPL
Carex longii	Long's sedge	ǂ	FACW
Chasmanthium laxum	Slender spikegrass		FACW
Commelina diffusa	Dayflower	ǂ	FACW
Digitaria ciliaris	Southern crabgrass	ǂ	UPL
Drymaria cordata	West Indian chickweed		FAC
Erechtites hieraciifolius	Fireweed	ǂ	FAC
Eupatorium capillifolium	Dogfennel		FAC
Galactia elliotii	Milkpea		UPL
Hypericum hypericoides	St. Andrews cross	ǂ	FAC
Panicum hemitomon	Maidencane		OBL
Paspalum setaceum	Thin paspalum		FAC
Pleopeltis polypodioides var. michauxiana	Resurrection fern		UPL
Rubus argutus	Sawtooth blackberry		FAC
Scoparia dulcis	Licorice weed	ǂ	FAC
Sabal palmetto	Cabbage palm		FAC
Tillandsia fasciculata	Cardinal airplant		UPL
Viburnum obovatum	Walter's viburnum		FACW
Species Not Listed in Table			
Axonopus furcatus	Flat-joint carpet grass	ǂ	FAC
Dichanthelium aciculare	Needleleaf witchgrass	ǂ	FACW
Eustachys glauca	Saltmarsh fingergrass	ǂ	FACW
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Ilex cassine	Dahoon holly		OBL
Juncus effusus	Softrush	ǂ	OBL
Juncus marginatus	Grassleaf rush	ǂ	FACW
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Nephrolepis exaltata	Boston fern		FAC
Pluchea foetida	Stinking camphor weed		FACW
Pterocaulon pycnostachyum	Blackroot	ǂ	UPL
Scleria baldwinii	Baldwin's nutrush	ǂ	FACW
Vicia acutifolia	Four-leaf vetch		FACW
Woodwardia areolata	Netted chain fern		OBL

TABLE 25: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Non-native Species			
Cuphea carthagenensis	Columbian waxweed	ǂ	FAC
Emilia sonchifolia	Tasselflower	ǂ	UPL
Pouzolzia zeylanica	Pouzolz's bush	ǂ	FAC
Nuisance Species [(2)]			
Imperata cylindrica	Cogon grass		UPL
Panicum maximum	Guineagrass	ǂ	UPL
Total Additional Species Listed in Tables		**6**	**19**
Total Additional Species Not Listed in Tables		**9**	**14**
Total Additional Non-native Species		**3**	**3**
Total Additional Nuisance Species		**1**	**2**
Total Additional Species		**19**	**38**

[(1)] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[(2)] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 26: TREE DENSITY BY SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Quercus nigra	Water oak	FACW	10	0	10	100	45.5	4.3	0
Quercus laurifolia	Laurel oak	FACW	8	0	8	80	36.4	134.7	0
Myrica cerifera	Wax myrtle	FAC	2	0	2	20	9.1	3.2	0
Tree Species Listed In Table Subtotals			**20**	**0**	**20**	**200**	**90.9**	**142.2**	**0**
Tree Species Not Listed in Table									
Salix caroliniana	Southern willow	OBL	1	0	1	10	4.6	3.5	0
Ilex cassine	Dahoon holly	OBL	1	0	1	10	4.6	<0.05	0
Tree Species Not Listed in Table Subtotals			**2**	**0**	**2**	**20**	**9.1**	**3.5**	**0**
TOTALS			**22**	**0**	**22**	**220**	**100.0**	**145.7**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	37	0	37	370
Baccharis halimifolia	Eastern false-willow	FAC	1	0	1	10
Shrub Species Listed in Table Subtotals			**38**	**0**	**38**	**380**
Shrub Species Not Listed in Table						
Lyonia lucida	Fetterbush	FAC	13	0	13	130
Rhus copallinum	Winged sumac	UPL	1	0	1	10
Shrub Species Not Listed in Table Subtotals			**14**	**0**	**14**	**140**
TOTALS			**52**	**0**	**52**	**520**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 27: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Serenoa repens	Saw palmetto	UPL	ǂ	13.3
Smilax bona-nox	Saw greenbrier	-		2.3
Quercus laurifolia	Laurel oak	FACW		2.2
Andropogon virginicus	Broomsedge	FAC	ǂ	1.7
Vitis rotundifolia	Muscadine grape	-		1.6
Galactia elliotii	Milkpea	UPL		0.9
Rubus argutus	Sawtooth blackberry	FAC		0.6
Smilax auriculata	Earleaf greenbriar	-		0.5
Eupatorium capillifolium	Dogfennel	FAC		0.3
Total Cover of Species Listed in Table			**(2)**	**23.4**
Species Not Listed in Table				
Woodwardia virginica	Virginia chain fern	FACW		2.4
Eriocaulon decangulare	Ten-angle pipewort	OBL	ǂ	1.0
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.9
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	0.6
Aeschynomene americana	Meadow joint-vetch	UPL		0.3
Hypericum cistifolium	Round-pod St. John's wort	FACW	ǂ	0.3
Total Cover of Species Not Listed in Table			**(4)**	**5.5**
Nuisance Species [2]				
Imperata cylindrica	Cogon grass	UPL		23.1
Paspalum notatum	Bahia grass	UPL	ǂ	3.4
Urena lobata	Caesarweed	UPL	ǂ	0.9
Total Cover of Nuisance Species			**(2)**	**27.4**
Total Species Cover			**8**	**56.3**
Total Bare Ground/Dead Litter				**43.7**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 28: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Table[1]			
Acer rubrum	Red maple		FACW
Ambrosia artemisiifolia	Common ragweed		UPL
Callicarpa americana	American beauty-berry		UPL
Carex longii	Long's sedge	ǂ	FACW
Cyperus retrorsus	Pinebarren flatsedge	ǂ	FAC
Desmodium paniculatum	Panicled Ticktrefoil	ǂ	UPL
Drymaria cordata	West Indian chickweed		FAC
Panicum hemitomon	Maidencane		OBL
Quercus virginiana	Live oak		UPL
Sabal palmetto	Cabbage palm		FAC
Solidago fistulosa	Pine-barren goldenrod	ǂ	FACW
Tillandsia usneoides	Spanish moss		UPL
Species Not Listed in Table			
Conyza canadensis	Dwarf horseweed	ǂ	UPL
Cyperus strigosus	Straw colored flatsedge	ǂ	FACW
Eleocharis baldwinii	Baldwin's spikerush	ǂ	OBL
Galium tinctorium	Bedstraw		FACW
Juncus marginatus	Grassleaf rush	ǂ	FACW
Lachnanthes caroliniana	Carolina redroot		FAC
Lycopodiella cernua	Nodding clubmoss		FACW
Lythrum alatum	Winged lythrum	ǂ	OBL
Panicum rigidulum	Red-top panic grass	ǂ	FACW
Persea palustris	Swamp bay		OBL
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		UPL
Pterocaulon pycnostachyum	Blackroot		UPL
Rhexia mariana	Meadow-beauty	ǂ	FACW
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	FACW
Vigna luteola	Hairypod cowpea	ǂ	-
Non-native Species			
Phyllanthus urinaria	Chamberbitter		FAC
Nuisance Species [2]			
Panicum repens	Torpedo grass	ǂ	FACW
Solanum viarum	Tropical soda apple		UPL
Total Additional Desirable Species Listed in Tables		**4**	**12**
Total Additional Species Not Listed in Tables		**9**	**15**
Total Additional Non-native Species		**0**	**1**
Total Additional Nuisance Species		**1**	**2**
Total Additional Species		**14**	**30**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 29: TREE DENSITY BY SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	SEEDLING
			LIVE	STRESSED				
Tree Species Listed in Table(1)								
Quercus geminata	Sand live oak	UPL	11	1	12	120	100.0	0
TOTALS			**11**	**1**	**12**	**120**	**100.0**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table(2)						
Serenoa repens	Saw palmetto	UPL	23	0	23	230
Rhus copallinum	Winged sumac	UPL	7	0	7	70
Quercus myrtifolia	Myrtle oak	UPL	5	0	5	50
Lyonia ferruginea	Rusty lyonia	UPL	2	0	2	20
TOTALS			**37**	**0**	**37**	**370**

(1) Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

(2) Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 30: HERBACEOUS COVER BY SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Andropogon virginicus	Broomsedge	FAC	ǂ	13.2
Aristida stricta	Wiregrass	FAC		5.5
Paspalum setaceum	Thin paspalum	FAC		4.7
Chrysopsis subulata	Scrubland goldenaster	UPL	ǂ	4.6
Croton michauxii	Rushfoil	UPL	ǂ	3.1
Quercus geminata	Sand live oak	UPL		3.1
Opuntia humifusa	Pricklypear	UPL		2.1
Vaccinium myrsinites	Shiny blueberry	UPL		1.5
Lechea torreyi	Piedmont pinweed	UPL		1.4
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.9
Licania michauxii	Gopher apple	UPL		0.8
Piloblephis rigida	Wild pennyroyal	UPL	ǂ	0.8
Galactia elliotii	Milkpea	UPL		0.6
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	0.6
Rhus copallinum	Winged sumac	UPL		0.6
Buchnera americana	American bluehearts	UPL	ǂ	0.3
Commelina erecta	Sandhill dayflower	UPL	ǂ	0.3
Stillingia sylvatica	Queensdelight	FAC		0.3
Total Cover of Species Listed in Tables			**(8)**	**44.4**
Species Not Listed in Tables				
Euthamia caroliniana	Slender goldenrod	FAC		6.4
Lachnocaulon anceps	White-head bogbutton	FACW	ǂ	2.3
Pterocaulon pycnostachyum	Blackroot	UPL	ǂ	1.4
Juncus scirpoides	Needlepod rush	OBL	ǂ	1.3
Dichanthelium acuminatum	Panic grass	FACW	ǂ	0.6
Smilax bona-nox	Saw greenbrier	-		0.6
Vaccinium corymbosum	Highbush blueberry	FACW		0.6
Polypremum procumbens	Rustweed	FAC	ǂ	0.3
Total Cover of Species Not Listed in Table			**(5)**	**13.5**
Non-native Species				
Bulbostylis barbata	Watergrass	UPL	ǂ	0.9
Total Cover of Non-native Species			**(1)**	**0.9**
Nuisance Species[2]				
Melinis repens	Natalgrass	UPL	ǂ	5.9
Total Cover of Nuisance Species			**(1)**	**5.9**
Total Species Cover			**15**	**64.7**
Total Bare Ground/Dead Litter				**35.3**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 31: ADDITIONAL SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Asimina obovata	Bigflower pawpaw		-
Eupatorium capillifolium	Dogfennel		FAC
Species Not Listed in Table			
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Helianthemum corymbosum	Pinebarren frostweed	ǂ	UPL
Ludwigia maritima	Seaside primrosewillow	ǂ	FACW
Quercus pumila	Running oak		UPL
Scoparia dulcis	Licorice weed	ǂ	FAC
Non-native Species			
Gamochaeta pensylvanica	Pennsylvania everlasting		UPL
Nuisance Species[2]			
Paspalum notatum	Bahia grass		UPL
Total Additional Species Listed in Tables		**1**	**3**
Total Additional Species Not Listed in Tables		**4**	**5**
Total Additional Non-native Species		**0**	**1**
Total Additional Nuisance Species		**0**	**1**
Total Additional Species		**5**	**10**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 32: TREE DENSITY BY SPECIES - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	SEEDLING
			LIVE	STRESSED				
Tree Species Not Listed in Table								
Quercus virginiana	Live oak	UPL	5	0	5	67	100.0	0
TOTAL			**5**	**0**	**5**	**67**	**100.0**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[(1)]						
Serenoa repens	Saw palmetto	UPL	27	0	27	360
Asimina obovata	Bigflower pawpaw	-	2	0	2	27
Vaccinium myrsinites	Shiny blueberry	UPL	2	0	2	27
TOTAL			**31**	**0**	**31**	**414**

[(1)] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 33: HERBACEOUS COVER BY SPECIES - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Serenoa repens	Saw palmetto	UPL	ǂ	6.3
Andropogon virginicus	Broomsedge	FAC	ǂ	4.2
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	3.3
Aristida stricta	Wiregrass	FAC		2.8
Opuntia humifusa	Pricklypear	UPL		2.3
Piloblephis rigida	Wild pennyroyal	UPL	ǂ	1.7
Vaccinium myrsinites	Shiny blueberry	UPL		1.3
Chrysopsis subulata	Scrubland goldenaster	UPL		1.0
Lechea torreyi	Piedmont pinweed	UPL	ǂ	0.8
Asimina obovata	Bigflower pawpaw	-		0.7
Paspalum setaceum	Thin paspalum	FAC		0.4
Yucca filamentosa	Adam's needle	UPL		0.4
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	2.1
Total Cover of Species Listed in Tables			**(6)**	**27.3**
Species Not Listed in Tables				
Dichanthelium acuminatum	Panic grass	FACW		3.4
Juncus scirpoides	Needlepod rush	OBL	ǂ	3.3
Quercus virginiana	Live oak	UPL		1.7
Syngonanthus flavidulus	Bantam-buttons	FACW	ǂ	1.3
Xyris sp.	Yellow-eyed grass	OBL	ǂ	1.3
Euthamia caroliniana	Slender goldenrod	FAC		0.4
Hypericum tetrapetalum	St. John's wort	FAC	ǂ	0.4
Pterocaulon pycnostachyum	Blackroot	UPL	ǂ	0.4
Total Cover of Species Not Listed in Tables			**(5)**	**12.2**
Total Species Cover			**11**	**39.5**
Total Bare Ground/Dead Litter				**60.5**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 34: ADDITIONAL SPECIES - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Elephantopus elatus	Tall elephantsfoot		UPL
Eupatorium capillifolium	Dogfennel		FAC
Galactia elliotii	Milkpea		UPL
Gratiola hispida	Rough hedgehyssop	ǂ	FAC
Heterotheca subaxillaris	Camphorweed	ǂ	UPL
Indigofera caroliniana	Carolina indigo		UPL
Smilax auriculata	Earleaf greenbriar		-
Vitis rotundifolia	Muscadine grape		-
Species Not Listed in Tables			
Erigeron quercifolius	Oak-leaf fleabane	ǂ	FAC
Panicum rigidulum	Red-top panic grass	ǂ	FACW
Parthenocissus quinquefolia	Virginia creeper		-
Pinus elliottii	Slash pine		UPL
Smilax bona-nox	Saw greenbrier		-
Non-native Species			
Bulbostylis barbata	Watergrass	ǂ	UPL
Senna occidentalis	Septicweed		UPL
Sporobolus indicus	Smutgrass	ǂ	UPL
Nuisance Species[2]			
Paspalum notatum	Bahia grass		UPL
Urena lobata	Caesarweed	ǂ	UPL
Total Additional Species Listed in Tables		**2**	**8**
Total Additional Species Not Listed in Tables		**2**	**5**
Total Additional Non-native Species		**2**	**3**
Total Additional Nuisance Species		**1**	**2**
Total Additional Species		**7**	**18**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 35: TREE DENSITY BY SPECIES - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	SEEDLING
			LIVE	STRESSED				
Tree Species Listed in Table[1]								
Quercus geminata	Sand live oak	UPL	22	0	22	293	100.0	0
TOTAL			**22**	**0**	**22**	**293**	**100.0**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	69	0	69	920
Rhus copallinum	Winged sumac	UPL	3	0	3	40
Ilex glabra	Gallberry	UPL	1	0	1	13
TOTALS			**73**	**0**	**73**	**973**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 36: HERBACEOUS COVER BY SPECIES - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Serenoa repens	Saw palmetto	UPL	ǂ	9.3
Aristida stricta	Wiregrass	FAC	ǂ	7.2
Quercus geminata	Sand live oak	UPL		5.4
Chrysopsis subulata	Scrubland goldenaster	UPL		3.8
Galactia elliotii	Milkpea	UPL		2.8
Ilex glabra	Gallberry	UPL		2.5
Bejaria racemosa	Tarflower	FAC	ǂ	2.3
Licania michauxii	Gopher apple	UPL		1.7
Indigofera caroliniana	Carolina indigo	UPL		1.7
Vaccinium myrsinites	Shiny blueberry	UPL		1.7
Lechea torreyi	Piedmont pinweed	UPL		1.3
Andropogon virginicus	Broomsedge	FAC	ǂ	1.0
Gratiola hispida	Rough hedgehyssop	FAC	ǂ	0.8
Quercus laevis	Turkey oak	UPL		0.4
Rhus copallinum	Winged sumac	UPL		0.4
Total Cover of Species Listed in Tables			**(5)**	**42.3**
Species Not Listed in Table				
Aristida spiciformis	Pinebarren three-awn	FAC	ǂ	5.9
Euthamia caroliniana	Slender goldenrod	FAC		1.3
Quercus pumila	Running oak	UPL		1.3
Pterocaulon pycnostachyum	Blackroot	UPL		1.1
Rhynchospora fascicularis	Fasciculate beakrush	FACW	ǂ	0.8
Total Cover of Species Not Listed in Table			**(2)**	**10.4**
Non-native Species				
Bulbostylis barbata	Watergrass	UPL	ǂ	2.1
Total Cover of Non-native Species			**(1)**	**2.1**
Total Species Cover			**8**	**54.8**
Total Bare Ground/Dead Litter				**45.2**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 37: ADDITIONAL SPECIES - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Callicarpa americana	American beauty-berry		UPL
Carphephorus corymbosus	Florida paintbrush	ǂ	UPL
Dichanthelium aciculare	Needleleaf witchgrass	ǂ	FACW
Paspalum setaceum	Thin paspalum		FAC
Solidago odorata var. chapmanii	Chapman's goldenrod		UPL
Stipulicida setacea var. lacerata	Pineland scalypink	ǂ	UPL
Species Not Listed in Tables			
Aeschynomene americana	Meadow joint-vetch		UPL
Hypericum tetrapetalum	St. John's wort	ǂ	FAC
Vaccinium corymbosum	Highbush blueberry		FACW
Total Additional Species Listed in Tables		**3**	**6**
Total Additional Species Not Listed in Tables		**1**	**3**
Total Additional Species		**4**	**9**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch																	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X		X													
Andropogon virginicus	Broomsedge	X	X						X					X		X		
Aristida stricta	Wiregrass		X						X									
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X					X										
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X		X													
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X		X		X	X											
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X										**X**					
Eupatorium capillifolium	Dogfennel		X	**X**														
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X		X	X												
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass					X								X			X	
Indigofera hirsuta	Hairy indigo	X		X	X						X				X			
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X		X	X	X	X		X	X	X	X			X			
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X										X					
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X						X					X					
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X												X			
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X								X	X	X						
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X		X		X	X											
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X							X	X							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X					X					X					
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X			X												
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X									X	X						
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X																
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Abutilon theophrasti	Velvetleaf												X					
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch																	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X				X											
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X				X											
Andropogon virginicus	Broomsedge	X	X		X													X
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X		X		X							X	X			
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															X
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X							X								
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle								X									
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X							X									
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X				X											X
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X												X				
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed												X					
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X				X								X			
Erigeron quercifolius	Oak-leaf fleabane		X															X
Eupatorium capillifolium	Dogfennel		X	X					X	X						X		
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X		X													
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X			X												
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X					X										
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X							X	X	X	X						X
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X					X										
Juncus megacephalus	Bighead rush	X						X										
Juncus scirpoides	Needlepod rush	X	X				X											
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X				X				X							
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X					X											
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X		X	X	X				X								
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X						X									
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X						X			X						
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X						X										
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X						X					X					
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X						X										
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		X									X	X	X	X		
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X								X							X	
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X												X				
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X						X	X	X			X	X	X	X	
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X					X										
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod						X											
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X							X									
Sporobolus indicus	Smutgrass	X			X	X						X		X	X	X		
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X					X											
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern						X											
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X													X			
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch							X										
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X											X	X		X	
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X			X												
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X				X											
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X						X										
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X			**X**												
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X	**X**	**X**	**X**	**X**											
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X					**X**										**X**
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X					X					X	X	X			
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X	X		X	X											
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass						X											
Indigofera hirsuta	Hairy indigo	X						X							X	X		
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X		X													
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow							X										
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	X
Melinis repens	Natalgrass	X						X										
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X																
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X					X										
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X		X		X											
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X					X										
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X										X					
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X															X	
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X			X				X		
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch																	X
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															X
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X											X		X	X	
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															X
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X						X									
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X																X
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X											X	X	X	X	
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																X
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X		X	X	X	X											
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X						X										
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X					X										
Cyperus retrorsus	Pinebarren flatsedge	X	X					X										
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X												X				
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															X
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X						X	X	X	X		X			X	
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X						X									
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X					X										
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X					X										
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	X
Indigofera hirsuta	Hairy indigo	X																
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															X
Juncus megacephalus	Bighead rush	X												X				
Juncus scirpoides	Needlepod rush	X	X															X
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X									X							
Ludwigia peruviana	Primrose willow																	X
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X												X	X	X		
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X						X										
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	X
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X												X		X	
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X								X							
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																X
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X												X				
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X						X										
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X							X	X	X	X						
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																X
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X						X			X						X
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	X
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X							X								
Smilax auriculata	Earleaf greenbriar		X					X										
Smilax bona-nox	Saw greenbrier							X										
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod													X	X	X		
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X															X	
Sporobolus indicus	Smutgrass	X								X		X			X			
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X	X	X	X									X		
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch			X									X			X		
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X														X	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X					X										X
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X										X					
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X					X										
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X					X											
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle			X					X									
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X		X					X	X	X			X	X	X		
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X					X			X							
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																X
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X				X						X					
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X														X	
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed												X					
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X										X					
Eupatorium capillifolium	Dogfennel		X	X					X	X								X
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X										X					
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X											X	X	X		X	
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X					X			X	X	X		X	X	X	X	
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X						X		X							
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																X
Paspalum setaceum	Thin paspalum		X															X
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		X	X	X						X		X			X	
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X								X							X	
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X										X					
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X										X						
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X	X		X			X		X	X			X			
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod												X					
Setaria parviflora	Knotroot bristle grass	X	X										X					
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X						X					X					
Sporobolus indicus	Smutgrass	X		X		X			X					X	X	X	X	
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X									
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X											X					
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch												X				X	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															X
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X					X										
Andropogon virginicus	Broomsedge	X	X	X		X	X											
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X											X	X		X		
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X										X				X	
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X			X	X	X											
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															X
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X		X													
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed				X		X											
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X											X					
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X					X										
Erigeron quercifolius	Oak-leaf fleabane		X													X		
Eupatorium capillifolium	Dogfennel		X					X		X								
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort							X										
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X					X										
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass							X										
Indigofera hirsuta	Hairy indigo	X													X	X		
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X											X	X	X	X	X	
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X						X										
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X							X	X		X					X	
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X								X								
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X						X	X							X	
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															X
Sesbania herbacea	Danglepod						X											
Setaria parviflora	Knotroot bristle grass	X	X					X										X
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod					X												
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X							X	X	X	X		X	X	X	X	
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X			X													X
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch																	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X						X	X		X						X
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X								X							
Andropogon virginicus	Broomsedge	X	X					X					X					
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X											X					
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X														X		
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						X									
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X								X		X						
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X										X					
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X											X					
Cyperus surinamensis	Tropical flatsedge	X							X									
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X							X	X	X						X
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X		**X**	**X**	**X**	**X**				**X**						**X**	
Ipomoea cordatotriloba	Tievine	X	X					**X**										
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X							**X**								
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X								X								
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X											X				X	
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X		X		X												
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X											X					
Paspalum setaceum	Thin paspalum		X							X		X						
Paspalum urvillei	Vaseygrass	X									X							
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X								X				X		X		
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X					X	X			X			X	X		
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X					X										
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X							X		X						X
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier										X							
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X						X						X	X	X	X	
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X									
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Abutilon theophrasti	Velvetleaf																	X
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch													X				
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X													X		
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															X
Andropogon virginicus	Broomsedge	X	X		X							X		X	X	X	X	
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															X
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																X	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X								X		X		X	X		X	
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X											X	X	X	X	
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X					X										X
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X												X		X		
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X														X	
Eupatorium capillifolium	Dogfennel		X			X												X
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X			X	X						X					
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X													X			
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X	X	X	X	X											
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass												X					
Indigofera hirsuta	Hairy indigo	X													X	X		
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X	X		X	X											
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X											X				
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X						X	X								
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																X	
Melinis repens	Natalgrass	X																X
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X										X					
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines												X					
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															X
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X		X														
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X						X										
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X								X							
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X										X						X
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																X
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X										X					
Pterocaulon pycnostachyum	Blackroot	X	X	X								X						
Ptilimnium capillaceum	Bishop-weed	X						X										
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac												X					
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X			X												
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X													X		
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X						X	X	X	X					X	
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X		X											X		
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X		X		X											
Smilax bona-nox	Saw greenbrier								X									
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X		X	X							X					
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X												X				
Sporobolus indicus	Smutgrass	X												X	X			
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X			X							X				
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X										X					
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X		X														
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch																	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X											X	X	X	X	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X		X	X								X				
Andropogon virginicus	Broomsedge	X	X	X					X	X	X	X			X	X	X	
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															X
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															X
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X			X												
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X						X										
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X					X		X								
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X						X										
Cyperus surinamensis	Tropical flatsedge	X																X
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X				X											
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed								X									
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X															X	
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X										X					
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X					X					X					X
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X				X											
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X							X								
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass					X						X					X	
Indigofera hirsuta	Hairy indigo	X						X										
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X										X	X	X	X	X	
Juncus megacephalus	Bighead rush	X				X												X
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X											X			X	
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X			X	X												
Macroptilium lathyroides	Phaseolus									X								
Melinis repens	Natalgrass	X					X			X								
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X												X		X	
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X												X		X	
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X						X										
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X						X										
Paspalum setaceum	Thin paspalum		X															X
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X											X					
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X												X			X	
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X	X			X											X
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X	X	X	X							X	X			X	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod				X	X												
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X									X							
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X						X	X			X						
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch											X						
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X	X	X	X	X											
Andropogon virginicus	Broomsedge	X	X										X			X		
Aristida stricta	Wiregrass		X															X
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															X
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle							X										
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X			X													
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X	X														X
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
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Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X								X								
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															X
Desmodium triflorum	Beggarweed	X													X			
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X	X		X	X											
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X															X
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

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4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

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Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X													X		
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X												X	X	X	X	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	X
Indigofera hirsuta	Hairy indigo	X											X	X	X		X	
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X					X										
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X							X	X	X	X		X	X	X	X	
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X				X											
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X					X											
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X												X	X	X	X	
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X						X								X	
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod			X	X		X											
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod			X	X	X	X											
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X												X	X	X	X	
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X																
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch												X					
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X											X	X			
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X											X		X		
Andropogon virginicus	Broomsedge	X	X	X	X	X	X						X					
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															X
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X														X	
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X													X		
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X							X	X	X					X	X	
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X								X			X	X		X	
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X								X	X							
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															X
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X								X	X						X
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X							X	X								
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															X
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X						X	X	X	X						
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

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4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

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Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X	X		X						X					
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															X
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X	X														
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass										X							
Indigofera hirsuta	Hairy indigo	X							X		X	X						X
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X					X									X	
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X		X		X											
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

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MU'S 15E, 16E, 17E, AND 19E

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Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																X
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X										X						
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines												X					
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X											X					
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X												X				
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X									X	X						
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X							X								X	
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X					X										
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X							X	X							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X							X				X				
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod													X		X	X	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X								X		X		X	X	X	X	
Syngonanthus flavidulus	Bantam-buttons	X	X		X	X	X											

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X								X	
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X		X			X											
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch							X										
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X							X	X	X						
Andropogon virginicus	Broomsedge	X	X					X	X					X	X	X	X	
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X					X										
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X																X
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X										X					
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X				X											
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X						X									
Digitaria serotina	Hairy crabgrass		X		X													
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X										X					
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X			X												
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X						X									X
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X						X	X	X							
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X				X											
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass												X					
Indigofera hirsuta	Hairy indigo	X		X														
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X						X	X	X							
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X							X								
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X																
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															x
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X			X	X	X											
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X						X		X							
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X										X					
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X	X			X											
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															X
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X								X							
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X		X		X												X
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X											X					
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	X
Aeschynomene americana	Meadow joint-vetch			X	X	X	X											
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X														X	
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X												X	X	X	X	
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X		X	X		X											
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle												X					
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X						X										
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															X
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X											X					
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X	X			X											
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X													X		
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X										X	X				
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X														X	
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass													X		X		
Indigofera hirsuta	Hairy indigo	X				X	X											
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow													X	X		X	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																X
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X		X														
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																X	X
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X													X		
Nephrolepis cordifolia	Tuberous swordfern													X	X		X	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X																
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X				X												
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X				X												
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X					X										
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X															X
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod														X	X	X	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X												X	X	X	X	
Sporobolus indicus	Smutgrass	X											X					X
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X									X					
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	X
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch												X					
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X						X									
Aristida stricta	Wiregrass		X											X				
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X										X					
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X						X			X							
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X							X	X	X						
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X							X								
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X							X	X		X						
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X					X										
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X											X	X			
Eupatorium capillifolium	Dogfennel		X								X	X						
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

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Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X										X					
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X			X	X				X	X	X						
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X															X	
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															X
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X				X	X											X
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines													X		X		
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X															X
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X										X					
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X									X						
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X							X	X	X	X						
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X						X										
Praxelis clematidea	Praxelis	X							X									
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X		X			X											
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X				X		X	X	X							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X											X	X	X	X	
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X										X					
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	X
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X											X					
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X																
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X														X	
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch							X						X				
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X					X										
Andropogon virginicus	Broomsedge	X	X	X	X	X	X							X				
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X										X			X		
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X									X							
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X							X									
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X												X				
Conyza canadensis	Dwarf horseweed	X					X										X	
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X			X												
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X						**X**										
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X							**X**		**X**						
Digitaria serotina	Hairy crabgrass		X		**X**													
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X					**X**										
Eupatorium capillifolium	Dogfennel		X											**X**				
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X	X													
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X		X														
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X		X					X	X		X		X	X	X		
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X				X											
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X	X		X	X											
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X		X														
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X							X			X		X	X	X	X	
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X					X										
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X					X											
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

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Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X					X										
Polypremum procumbens	Rustweed	X			X		X							X	X			
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X							X									
Praxelis clematidea	Praxelis	X										X						
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X					X										
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X					X										
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X			X	X							X	X			
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X			X												
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X					X										
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X													X			
Syngonanthus flavidulus	Bantam-buttons	X	X		X													

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
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MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X					X			X	X	X						
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X					X											
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch								X	X								
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X					X										X
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X					X										
Bulbostylis barbata	Watergrass	X																
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle									X	X	X						
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X			X		X											
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X					X		X	X							
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X											X					
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X							X								
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X						X	X	X	X						
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X											X					
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X										X					
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X	X	X		X		X	X	X	X						X
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X		X		X											
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X																X
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X		**X**														
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X																
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered mille graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X	**X**									**X**					
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X				**X**												
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X									**X**							
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X										X					
Polypremum procumbens	Rustweed	X		X		X												
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X																
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X	X	X		X											
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X						X	X		X						
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X						X										X
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X	X	X	X						X
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X						X										
Yucca filamentosa	Adam's needle		X															
Total		**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Abutilon theophrasti	Velvetleaf									X								
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch													X			X	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X		X													
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X						X		X							
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X		X														
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X															
Chamaesyce hirta	Pillpod sandmat	X																X
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X		X														
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X														X	X	
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X													X		
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X				X												X
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Crotalaria spectabilis	Rattle-box																	
Croton glandulosus	Vente conmigo	X																
Croton michauxii	Rushfoil	X																
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge	X																
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus polystachyos	Manyspike flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X										X					
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X													X		
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed											X						
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X																
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X						X									
Eupatorium capillifolium	Dogfennel		X										X					
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X							X	X	X						
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X								X							
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X					X											
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X																
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass												X					
Indigofera hirsuta	Hairy indigo	X			X	X							X	X			X	
Ipomoea cordatotriloba	Tievine	X	X						X	X	X	X						
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X																
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X																
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X		X	X	X	X							X	X	X	X	
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum maximum	Guineagrass	X																
Panicum repens	Torpedo grass	X											X					
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X						X										
Paspalum setaceum	Thin paspalum		X	X														
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent	X																
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X																
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X			X						X							
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X															
Ptilimnium capillaceum	Bishop-weed	X																
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia	X						X										
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scoparia dulcis	Licorice weed	X	X		X													X
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X												X			
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X		X													
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Syngonanthus flavidulus	Bantam-buttons	X	X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X								X								
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Abutilon theophrasti	Velvetleaf																	
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch												X	X	X	X	X	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X													X		
Andropogon virginicus	Broomsedge	X	X					X					X					
Aristida stricta	Wiregrass		X		X	X	X		X	X	X	X						
Axonopus fissifolius	Southern carpet grass	X	X										X					
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bacopa monnieri	Water hyssop																	
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X										X					
Bidens laevis	Bur-marigold																	
Boehmeria cylindrica	Small-spike false nettle	X											X					
Buchnera americana	American bluehearts	X	X										X					
Bulbostylis barbata	Watergrass	X											X					
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Carya glabra	Pignut hickory																	
Cenchrus spinifex	Coastal sandbur																	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant	X	X										X					
Chamaesyce hirta	Pillpod sandmat	X											X					
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X											X					
Chamaesyce prostrata	Prostrate sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle												X	X	X	X		
Commelina diffusa	Dayflower	X											X					
Commelina erecta	Sandhill dayflower		X															
Commelina gambiae	Gambian dayflower	X											X					
Conyza canadensis	Dwarf horseweed	X								X								
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X					X					X					X
Crocanthemum corymbosum	Pinebarren frostweed																	
Crotalaria lanceolata	Lanceleaf rattle-box																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria pallida var. obovata	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X										X					

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Crotalaria spectabilis	Rattle-box							X										
Croton glandulosus	Vente conmigo	X											X					
Croton michauxii	Rushfoil	X											X					
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X											X					
Cynodon nlemfuensis	African Bermudagrass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X										X					
Cyperus difformis	Variable flatsedge																	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X											X					
Cyperus iria	Rice flatsedge	X											X				X	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge	X											X					
Cyperus polystachyos	Manyspike flatsedge	X	X										X					
Cyperus retrorsus	Pinebarren flatsedge	X	X										X					X
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X											X					
Cyperus surinamensis	Tropical flatsedge	X											X					
Cyperus virens	Green flatsedge	X											X					
Desmodium incanum	Zarzabacao comun	X	X										X					
Desmodium triflorum	Beggarweed	X											X					X
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichondra caroliniensis	Carolina pony-foot																	
Digitaria ciliaris	Southern crabgrass	X	X										X	X	X	X	X	
Digitaria serotina	Hairy crabgrass		X															
Diodia teres	Poor joe																	
Diodia virginiana	Rough button-weed		X															
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur	X																
Eclipta prostrata	Upright burhead	X											X				X	
Eleocharis baldwinii	Baldwin's spikerush		X															
Eleocharis interstincta	Knotted spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower	X											X					
Emilia sonchifolia	Tasselflower	X											X					
Eragrostis atrovirens	Thalia lovegrass	X						X										
Eragrostis elliottii	Elliot's lovegrass	X	X										X					
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X	X			X			X			X					X
Eupatorium capillifolium	Dogfennel		X					X							X	X	X	
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X								X							X
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X											X					
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X										X					
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X		X	X							X					
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X										X					
Gelsemium sempervirens	Yellow jessamine																	
Habenaria floribunda	Toothpetal false reinorchid																	
Helenium amarum	Bitterweed		X															
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed	X											X					
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X											X					
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort	X											X					
Hypericum tetrapetalum	St. John's wort	X	X										X					
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass												X					
Indigofera hirsuta	Hairy indigo	X											X					X
Ipomoea cordatotriloba	Tievine	X	X															
Ipomoea quamoclit	Cypressvine																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X					X					X					
Juncus megacephalus	Bighead rush	X											X					
Juncus scirpoides	Needlepod rush	X	X	X			X		X	X		X	X					
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X					X										

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass	X											X					
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia dubia var. anagallidea	Yellowseed false pimpernel																	
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X											X					
Ludwigia peruviana	Primrose willow												X					
Ludwigia repens	Red-leaf ludwigia		X															
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X						X					X					
Melochia corchorifolia	Chocolate-weed																	
Mikania scandens	Climbing hempvine												X					
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X					X										
Nephrolepis cordifolia	Tuberous swordfern																	
Oenothera laciniata	Cutleaf evening primrose																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X												X		X	
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X											X					
Panicum hemitomon	Maidencane	X	X										X					
Panicum maximum	Guineagrass	X											X					
Panicum repens	Torpedo grass	X											X					
Parietaria floridana	Florida pellitory																	
Paspalum conjugatum	Sour paspalum	X											X					
Paspalum distichum	Knot grass																	
Paspalum floridanum	Florida paspalum																	
Paspalum notatum	Bahia grass	X											X					X
Paspalum setaceum	Thin paspalum		X										X					
Paspalum urvillei	Vaseygrass	X											X					
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																X	
Phytolacca americana	Common pokeweed	X																
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X										X					
Pluchea odorata	Sweetscent	X											X				X	
Pluchea rosea	Rosy camphorweed		X															

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Polygonella fimbriata	Sandhill wiregrass																	
Polygonum hydropiperoides	Mild waterpepper		X															
Polygonum punctatum	Dotted smartweed	X	X										X					
Polypremum procumbens	Rustweed	X								X		X	X					
Pontederia cordata	Pickerelweed																	
Portulaca pilosa	Pink purslane	X											X					
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X								X							
Ptilimnium capillaceum	Bishop-weed	X																X
Quercus chapmanii	Chapman's oak																	
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora ciliaris	Fringed beakrush		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X										X					
Rhynchospora microcarpa	Southern beakrush	X											X					
Richardia brasiliensis	Richardia	X											X					
Rubus cuneifolius	Sand Blackberry																	
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X											X					
Sacciolepis striata	American cupscale		X															
Sagittaria latifolia	Duck potato																	
Schizachyrium stoloniferum	Creeping little bluestem			X			X		X	X	X	X						
Scoparia dulcis	Licorice weed	X	X															
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X					X				X						
Sesbania herbacea	Danglepod												X					
Setaria parviflora	Knotroot bristle grass	X	X										X	X				
Sida rhombifolia	Indian hemp		X										X					
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum americanum	Common nightshade																	
Solanum viarum	Tropical soda apple																	X
Solidago fistulosa	Pine-barren goldenrod		X										X					
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed	X											X					
Sporobolus indicus	Smutgrass	X																
Syngonanthus flavidulus	Bantam-buttons	X	X		X	X	X			X			X					

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Thelypteris kunthii	Southern shield fern																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X											X	X		X		
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X										X					
Vernonia gigantea	Giant ironweed																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia virginica	Virginia chain fern																	
Xyris platylepsis	Tall yellow-eyed grass		X															
Xyris sp.	Yellow-eyed grass	X			X	X							X					
Yucca filamentosa	Adam's needle		X															
	Total	**86**	**99***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Abutilon theophrasti	Velvetleaf												
Acrostichum danaeifolium	Giant leather fern												
Aeschynomene americana	Meadow joint-vetch								X				
Aeschynomene indica	India joint-vetch												
Agalinis fasciculata	Beach False-foxglove		X										
Alysicarpus ovalifolius	False moneywort												
Ambrosia artemisiifolia	Common ragweed		X										
Amphicarpum muehlenbergianum	Blue maidencane		X										
Andropogon glomeratus	Bushy bluestem	X	X		X								
Andropogon virginicus	Broomsedge	X	X							X			
Aristida stricta	Wiregrass		X										
Axonopus fissifolius	Southern carpet grass	X	X										
Axonopus furcatus	Flat-joint carpet grass		X										
Baccharis halimifolia	Eastern false-willow		X										
Bacopa monnieri	Water hyssop												
Begonia cucullata	Wax begonia												
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X										
Bidens laevis	Bur-marigold												
Boehmeria cylindrica	Small-spike false nettle	X											
Buchnera americana	American bluehearts	X	X								X		
Bulbostylis barbata	Watergrass	X											
Bulbostylis barbata	Watergrass												
Carex longii	Long's sedge		X										
Carphephorus corymbosus	Florida paintbrush		X										
Carphephorus odoratissimus	Pineland purple		X										
Carya glabra	Pignut hickory												
Cenchrus spinifex	Coastal sandbur												
Centella asiatica	Asian coinwort		X										
Ceratopteris thalictroides	Watersprite												
Chamaecrista fasciculata	Partridge-pea		X										
Chamaecrista nictitans	Wild sensitive plant	X	X										
Chamaesyce hirta	Pillpod sandmat	X											
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X											
Chamaesyce prostrata	Prostrate sandmat												
Cirsium horridulum	Thistle												
Cirsium nuttallii	Nuttall's thistle												
Commelina diffusa	Dayflower	X											
Commelina erecta	Sandhill dayflower		X										
Commelina gambiae	Gambian dayflower	X											
Conyza canadensis	Dwarf horseweed	X		X									
Coreopsis floridana	Florida tickseed		X										
Coreopsis leavenworthii	Leavenworth's tickseed	X	X										
Crocanthemum corymbosum	Pinebarren frostweed												
Crotalaria lanceolata	Lanceleaf rattle-box												
Crotalaria pallida	Smooth rattle-box	X											
Crotalaria pallida var. obovata	Smooth rattle-box												
Crotalaria rotundifolia	Rabbitbells		X										

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Crotalaria spectabilis	Rattle-box												
Croton glandulosus	Vente conmigo	X		X			X						
Croton michauxii	Rushfoil	X											
Cuphea carthagenensis	Columbian waxweed												
Cynodon dactylon	Bermuda grass	X											
Cynodon nlemfuensis	African Bermudagrass												
Cyperus alopecuroides	Foxtail flatsedge												
Cyperus compressus	Poorland flatsedge		X										
Cyperus croceus	Baldwin flatsedge	X	X					X			X		
Cyperus difformis	Variable flatsedge												
Cyperus flavescens	Yellow flatsedge												
Cyperus haspan	Haspan flatsedge	X											
Cyperus iria	Rice flatsedge	X											
Cyperus lanceolatus	Epiphytic flatsedge												
Cyperus odoratus	Fragrant flatsedge	X											
Cyperus polystachyos	Manyspike flatsedge	X	X										
Cyperus retrorsus	Pinebarren flatsedge	X	X										
Cyperus rotundus	Nutgrass												
Cyperus strigosus	Straw colored flatsedge	X											
Cyperus surinamensis	Tropical flatsedge	X											
Cyperus virens	Green flatsedge	X											
Desmodium incanum	Zarzabacao comun	X	X										
Desmodium triflorum	Beggarweed	X							X				
Dichanthelium aciculare	Needleleaf witchgrass		X										
Dichanthelium acuminatum	Panic grass												
Dichanthelium commutatum	Variable witchgrass												
Dichanthelium ensifolium	Cypress witchgrass		X										
Dichondra caroliniensis	Carolina pony-foot												
Digitaria ciliaris	Southern crabgrass	X	X					X					
Digitaria serotina	Hairy crabgrass		X										
Diodia teres	Poor joe												
Diodia virginiana	Rough button-weed		X										
Drymaria cordata	West Indian chickweed												
Echinochloa walteri	Coast cockspur	X											
Eclipta prostrata	Upright burhead	X											
Eleocharis baldwinii	Baldwin's spikerush		X										
Eleocharis interstincta	Knotted spikerush												
Elephantopus elatus	Tall elephantsfoot		X										
Emilia fosbergii	Florida tasselflower	X											
Emilia sonchifolia	Tasselflower	X						X					
Eragrostis atrovirens	Thalia lovegrass	X											
Eragrostis elliottii	Elliot's lovegrass	X	X										
Eragrostis spectabilis	Purple lovegrass	X	X										
Erechtites hieraciifolius	Fireweed		X										
Erigeron quercifolius	Oak-leaf fleabane		X					X					
Eupatorium capillifolium	Dogfennel		X	X									X
Euphorbia polyphylla	Lesser florida spurge		X										

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Eupatorium rotundifolium	False hoarhound		X										
Eupatorium serotinum	Late-flowering thorough-wort												
Eustachys glauca	Saltmarsh fingergrass	X	X										
Eustachys petraea	Rock fingergrass		X										
Euthamia caroliniana	Slender goldenrod		X		X								
Fimbristylis autumnalis	Fringe-rush		X										
Fimbristylis dichotoma	Forked fimbry	X											
Fimbristylis puberula	Vahl's hairy fringe-rush		X										
Froelichia floridana	Cottonweed	X	X										
Fuirena pumila	Umbrella-sedge												
Galactia elliotii	Milkpea		X		X	X							
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X					X					X
Gelsemium sempervirens	Yellow jessamine												
Habenaria floribunda	Toothpetal false reinorchid												
Helenium amarum	Bitterweed		X										
Helianthemum corymbosum	Pinebarren frostweed		X										
Helianthus angustifolius	Narrowleaf sunflower		X										
Heterotheca subaxillaris	Camphorweed	X											
Hydrocotyle umbellata	Manyflower marshpennywort		X										
Hypericum cistifolium	Round-pod St. John's wort	X											
Hypericum hypericoides	St. Andrews cross												
Hypericum mutilum	Dwarf St. John's-wort	X											
Hypericum tetrapetalum	St. John's wort	X	X										
Hyptis alata	Musky mint		X										
Hyptis verticillata	John Charles												
Ilex cassine	Dahoon holly												
Ilex glabra	Gallberry		X										
Imperata cylindrica	Cogon grass							X					
Indigofera hirsuta	Hairy indigo	X										X	
Ipomoea cordatotriloba	Tievine	X	X										
Ipomoea quamoclit	Cypressvine												
Juncus effusus	Softrush												
Juncus marginatus	Grassleaf rush	X	X										
Juncus megacephalus	Bighead rush	X											
Juncus scirpoides	Needlepod rush	X	X										
Kummerowia striata	Japanese clover												
Kyllinga brevifolia	Shortleaf spikesedge												
Lachnanthes caroliniana	Carolina redroot		X										

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Lachnocaulon anceps	White-head bogbutton		X										
Lechea deckertii	Deckert's pinweed												
Lepidium virginicum	Pepper grass	X											
Lindernia crustacea	Malaysian false pimpernel												
Lindernia dubia var. anagallidea	Yellowseed false pimpernel												
Lindernia grandiflora	False pimpernel												
Ludwigia maritima	Seaside primrosewillow	X	X										
Ludwigia octovalvis	Large seedbox	X											
Ludwigia peruviana	Primrose willow												
Ludwigia repens	Red-leaf ludwigia		X										
Lycopodiella cernua	Nodding clubmoss												
Lygodium japonicum	Japanese climbing fern												
Lyonia lucida	Fetterbush		X										
Lythrum alatum	Winged lythrum	X											
Macroptilium lathyroides	Phaseolus												
Melinis repens	Natalgrass	X		**X**	**X**	**X**							
Melochia corchorifolia	Chocolate-weed												
Mikania scandens	Climbing hempvine												
Mollugo verticillata	Green carpetweed												
Myrica cerifera	Wax myrtle		X										
Nephrolepis cordifolia	Tuberous swordfern												
Oenothera laciniata	Cutleaf evening primrose												
Oldenlandia corymbosa	Flattop mille graines												
Oldenlandia uniflora	Clustered millie graines		X										
Opuntia humifusa	Pricklypear		X										
Osmunda cinnamomea	Cinnamon fern												
Oxalis corniculata	Yellow wood sorrel	X	X										
Panicum anceps	Beaked panic grass		X										
Panicum dichotomiflorum	Fall panicum	X											
Panicum hemitomon	Maidencane	X	X										
Panicum maximum	Guineagrass	X											
Panicum repens	Torpedo grass	X											
Parietaria floridana	Florida pellitory												
Paspalum conjugatum	Sour paspalum	X											
Paspalum distichum	Knot grass												
Paspalum floridanum	Florida paspalum												
Paspalum notatum	Bahia grass	X											
Paspalum setaceum	Thin paspalum		X		**X**								
Paspalum urvillei	Vaseygrass	X											
Phyla nodiflora	Frog-fruit		X										
Phyllanthus urinaria	Chamberbitter												
Phytolacca americana	Common pokeweed	X											
Piloblephis rigida	Wild pennyroyal		X										
Pinus elliottii	Slash pine		X										
Pityopsis graminifolia	Narrowleaf silkgrass	X	X										
Pluchea odorata	Sweetscent	X											
Pluchea rosea	Rosy camphorweed		X										

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Polygonella fimbriata	Sandhill wiregrass												
Polygonum hydropiperoides	Mild waterpepper		X										
Polygonum punctatum	Dotted smartweed	X	X										
Polypremum procumbens	Rustweed	X		X							X		
Pontederia cordata	Pickerelweed												
Portulaca pilosa	Pink purslane	X											
Praxelis clematidea	Praxelis	X											
Pseudognaphalium obtusifolium	Rabbit tobacco		X										
Pteridium aquilinum	Bracken fern		X										
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X										
Pterocaulon pycnostachyum	Blackroot	X	X										
Ptilimnium capillaceum	Bishop-weed	X											
Quercus chapmanii	Chapman's oak												
Quercus geminata	Sand live oak												
Quercus laurifolia	Laurel oak												
Quercus nigra	Water oak												
Quercus pumila	Running oak		X										
Quercus virginiana	Live oak		X										
Rhexia mariana	Meadow-beauty	X	X										
Rhus copallinum	Winged sumac												
Rhynchospora ciliaris	Fringed beakrush		X										
Rhynchospora fascicularis	Fasciculate beakrush	X	X										
Rhynchospora microcarpa	Southern beakrush	X											
Richardia brasiliensis	Richardia	X											
Rubus cuneifolius	Sand Blackberry												
Rumex hastatulus	Dock												
Sabal palmetto	Cabbage palm		X										
Sacciolepis indica	Glenwood grass	X											
Sacciolepis striata	American cupscale		X										
Sagittaria latifolia	Duck potato												
Schizachyrium stoloniferum	Creeping little bluestem												
Scoparia dulcis	Licorice weed	X	X	X					X	X	X	X	
Senna occidentalis	Septicweed												
Serenoa repens	Saw palmetto	X	X										
Sesbania herbacea	Danglepod												
Setaria parviflora	Knotroot bristle grass	X	X										
Sida rhombifolia	Indian hemp		X										
Smilax auriculata	Earleaf greenbriar		X										
Smilax bona-nox	Saw greenbrier												
Solanum americanum	Common nightshade												
Solanum viarum	Tropical soda apple												
Solidago fistulosa	Pine-barren goldenrod		X										
Solidago sempervirens	Seaside goldenrod												
Spartina bakeri	Sand cordgrass		X										
Spermacoce verticillata	Shrubby false buttonweed	X											
Sporobolus indicus	Smutgrass	X					X						
Syngonanthus flavidulus	Bantam-buttons	X	X										

X = occurrence within the quadrat

TABLE 38: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Thelypteris kunthii	Southern shield fern												
Typha sp.	Cattail												
Urena lobata	Caesarweed	X											
Urochloa mutica	Paragrass												
Vaccinium corymbosum	Highbush blueberry												
Vaccinium myrsinites	Shiny blueberry		X										
Vernonia gigantea	Giant ironweed												
Vicia acutifolia	Four-leaf vetch												
Vitis rotundifolia	Muscadine grape												
Wahlenbergia marginata	Southern rockbell	X											
Woodwardia virginica	Virginia chain fern												
Xyris platylepsis	Tall yellow-eyed grass		X										
Xyris sp.	Yellow-eyed grass	X											
Yucca filamentosa	Adam's needle		X										
	Total	**86**	**99***										

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 39: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Abutilon theophrasti	Velvetleaf																	
Acer rubrum	Red maple						X											
Aeschynomene americana	Meadow joint-vetch																	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Agalinus purpurea	Large purple false-foxglove	X											X					
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine							X										
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem		X															
Andropogon virginicus	Broomsedge	X	X			X	X							X	X	X	X	
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw		X															
Axonopus fissifolius	Southern carpet grass	X	X							X	X							
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens laevis	Bur-marigold																	
Buchnera americana	American bluehearts	X	X						X	X	X							
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle										X							
Commelina erecta	Sandhill dayflower		X															
Conyza canadensis	Dwarf horseweed	X									X							
Coreopsis leavenworthii	Leavenworth's tickseed		X															
Crotalaria pallida	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															
Croton michauxii	Rushfoil																	
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X				X											
Cyperus croceus	Baldwin flatsedge	X	X					X						X	X	X	X	
Cyperus flavescens	Yellow flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus odoratus	Fragrant flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge		X															

X = Occurence within the quadrat

TABLE 39: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Cyperus strigosus	Straw colored flatsedge	X											X					
Cyperus surinamensis	Tropical flatsedge																	
Desmodium incanum	Zarzabacao comun	X	X					X										X
Desmodium triflorum	Beggarweed																	
Dichanthelium acuminatum	Panic grass						X							X				
Digitaria ciliaris	Southern crabgrass		X															
Diospyros virginiana	Persimmon																	
Drymaria cordata	West Indian chickweed																	
Echinochloa walteri	Coast cockspur																	
Eclipta prostrata	Upright burhead																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower																	
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X								X			X	X	X		
Eupatorium rotundifolium	False hoarhound		X															
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X					X				X						
Fimbristylis autumnalis	Fringe-rush		X															
Froelichia floridana	Cottonweed		X															
Galactia elliotii	Milkpea		X													X		
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine			X		X	X											X
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort																	
Hypericum hypericoides	St. Andrews cross	X		X														
Hypericum tetrapetalum	St. John's wort	X	X						X									
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X							X			X						
Juncus effusus	Softrush	X																
Juncus marginatus	Grassleaf rush	X	X										X					
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush	X	X															

X = Occurence within the quadrat

TABLE 39: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Lachnocaulon anceps	White-head bogbutton	X	X															
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Lindernia grandiflora	False pimpernel																	
Liquidambar styraciflua	Sweetgum			X	X													
Ludwigia maritima	Seaside primrosewillow	X	X								X						X	
Ludwigia octovalvis	Large seedbox																	
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lygodium japonicum	Japanese climbing fern							X										
Lythrum alatum	Winged lythrum																	
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass																	
Mikania scandens	Climbing hempvine																	
Oenothera laciniata	Cutleaf evening primrose																	
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel		X															
Panicum hemitomon	Maidencane		X															
Panicum maximum	Guineagrass	X					X											
Panicum repens	Torpedo grass																	
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper					X												X
Paspalum conjugatum	Sour paspalum	X																
Paspalum notatum	Bahia grass	X				X						X			X			
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea odorata	Sweetscent																	
Polygonum punctatum	Dotted smartweed		X															
Polypremum procumbens	Rustweed	X							X	X								

X = Occurence within the quadrat

TABLE 39: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Praxelis clematidea	Praxelis	X											X					
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X					X		X								
Ptilimnium capillaceum	Bishop-weed																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak			X	X													
Rhexia mariana	Meadow-beauty		X															
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia																	
Rubus argutus	Sawtooth blackberry			X														
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass																	
Sacciolepis striata	American cupscale		X															
Scoparia dulcis	Licorice weed	X	X					X	X	X	X	X						
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Setaria parviflora	Knotroot bristle grass		X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier				X													
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X											X			X	
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce verticillata	Shrubby false buttonweed																	
Sporobolus indicus	Smutgrass	X							X									
Syngonanthus flavidulus	Bantam-buttons		X															
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X		X	X						X	X	X	X	X	
Urena lobata	Caesarweed																	
Vaccinium corymbosum	Highbush blueberry																	
Vitis rotundifolia	Muscadine grape							X										
Wahlenbergia marginata	Southern rockbell																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass																	
Totals		**27**	**66***															

* Total number of HCPMRM List Species observed since monitoring started

X = Occurence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Acer rubrum	Red maple																	
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Andropogon glomeratus	Bushy bluestem	X	X											X	X			
Andropogon virginicus	Broomsedge	X	X	X		X	X										X	
Aristida spiciformis	Pinebarren three-awn		X				X											
Aristida stricta	Wiregrass		X		X				X	X	X	X						X
Asimina obovata	Bigflower pawpaw		X															
Asimina reticulata	Netted pawpaw		X															
Baccharis halimifolia	Eastern false-willow		X															
Buchnera americana	American bluehearts		X										X					
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Cephalanthus occidentalis	Buttonbush																	
Chapmannia floridana	Florida alicia		X															
Chrysopsis subulata	Scrubland goldenaster	X																
Cirsium nuttallii	Nuttall's thistle																	
Cnidoscolus stimulosus	Tread-softly	X	X															
Conyza canadensis	Dwarf horseweed	X																
Coreopsis leavenworthii	Leavenworth's tickseed	X	X					X										
Crocanthemum corymbosum	Pinebarren frostweed																	
Croton michauxii	Rushfoil	X																
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus retrorsus	Pinebarren flatsedge	X	X						X									
Cyperus virens	Green flatsedge																	
Dichanthelium aciculare	Needleleaf witchgrass	X	X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass	X																
Digitaria ciliaris	Southern crabgrass		X															
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Diospyros virginiana	Persimmon																	
Echinochloa walteri	Coast cockspur																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X					X					X					
Eragrostis elliottii	Elliot's lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X					X										
Euphorbia polyphylla	Lesser florida spurge		X								X			X				

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Eupatorium rotundifolium	False hoarhound		X						**X**									
Euthamia caroliniana	Slender goldenrod		X	**X**	**X**	**X**	**X**		**X**	**X**		**X**		**X**	**X**	**X**	**X**	
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Galactia elliotii	Milkpea		X	**X**	**X**	**X**	**X**							**X**	**X**	**X**	**X**	
Gaylussacia dumosa	Dwarf huckleberry		X															
Gelsemium sempervirens	Yellow jessamine																	
Gordonia lasianthus	Loblolly bay																	
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross	X																
Hypericum mutilum	Dwarf St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															**X**
Hypoxis juncea	Yellow star grass	X	X															
Hyptis alata	Musky mint		X														**X**	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera caroliniana	Carolina indigo	X						**X**										
Indigofera suffruticosa	Anil de pasto																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Lachnocaulon anceps	White-head bogbutton	X	X										**X**					
Lechea deckertii	Deckert's pinweed	X																
Lechea torreyi	Piedmont pinweed	X	X										**X**					
Lespedeza hirta	Hairy bush clover																	
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X						**X**	**X**	**X**	**X**						
Ludwigia maritima	Seaside primrosewillow	X	X				**X**											
Ludwigia peruviana	Primrose willow																	
Lycopodiella cernua	Nodding clubmoss																	
Lycopus rubellus	Taper-leaf bugleweed																	
Lygodesmia aphylla	Roserush	X	X															
Lyonia fruticosa	Coastplain Staggerbush		X															
Mikania scandens	Climbing hempvine																	
Mimosa quadrivalvis var. floridana	Florida sensitive brier		X															
Mimosa strigillosa	Mimosa																	
Myrica cerifera	Wax myrtle		X															
Oclemena reticulata	Whitetop aster	X																
Opuntia humifusa	Pricklypear		X										**X**					

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Osmunda cinnamomea	Cinnamon fern																	
Panicum hemitomon	Maidencane		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal	X	X							**X**								
Pinus clausa	Sand pine																	
Pinus taeda	Loblolly pine																	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X								**X**							
Polgyala rugelii	Yellow milwort	X	X															
Polygala lutea	Orange milkwort		X															
Polygonum punctatum	Dotted smartweed		X															
Polygala setacea	coastalplain milkwort	X	X															
Polypremum procumbens	Rustweed	X																
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															**X**
Pterocaulon pycnostachyum	Blackroot	X	X								**X**							
Pteris vittata	Chinese ladder brake	X																
Pteroglossaspis ecrsistata	Giant orchid		X															
Quercus geminata	Sand live oak																	
Quercus laevis	Turkey oak																	
Quercus myrtifolia	Myrtle oak		X		**X**													
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora gracilenta	Slender beaksedge	X																
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia																	
Rubus argutus	Sawtooth blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Saccharum giganteum	Sugarcane plumegrass														**X**	**X**	**X**	
Sacciolepis striata	American cupscale		X															
Saururus cernuus	Lizard's tail																	
Schizachyrium stoloniferum	Creeping little bluestem			**X**	**X**											**X**		
Scleria reticularis	Nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X										**X**					
Serenoa repens	Saw palmetto	X	X		**X**	**X**			**X**									**X**
Setaria parviflora	Knotroot bristle grass		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	**X**

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Solidago fistulosa	Pine-barren goldenrod		X														**X**	
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Stillingia sylvatica	Queensdelight		X				**X**						**X**					
Syngonanthus flavidulus	Bantam-buttons	X	X															
Thelypteris kunthii	Southern shield fern																	
Urena lobata	Caesarweed	X												**X**				
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X							**X**		**X**						
Vaccinium stamineum	Deerberry																	
Vitis rotundifolia	Muscadine grape																	**X**
Woodwardia virginica	Virginia chain fern													**X**				
Xyris elliottii	Elliott's yellow-eyed grass																	
Xyris sp.	Yellow-eyed grass	X			**X**													
	Totals	**48**	**78***															

***** Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Acer rubrum	Red maple																	
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Andropogon glomeratus	Bushy bluestem	X	X			**X**												
Andropogon virginicus	Broomsedge	X	X				**X**		**X**	**X**		**X**			**X**			
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X						**X**		**X**							
Asimina obovata	Bigflower pawpaw		X															
Asimina reticulata	Netted pawpaw		X															
Baccharis halimifolia	Eastern false-willow		X															
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Cephalanthus occidentalis	Buttonbush																	
Chapmannia floridana	Florida alicia		X															
Chrysopsis subulata	Scrubland goldenaster	X																
Cirsium nuttallii	Nuttall's thistle																	
Cnidoscolus stimulosus	Tread-softly	X	X															
Conyza canadensis	Dwarf horseweed	X																
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crocanthemum corymbosum	Pinebarren frostweed																	
Croton michauxii	Rushfoil	X												**X**	**X**	**X**	**X**	
Cyperus croceus	Baldwin flatsedge	X	X				**X**											
Cyperus difformis	Variable flatsedge																	
Cyperus retrorsus	Pinebarren flatsedge	X	X				**X**							**X**				
Cyperus virens	Green flatsedge																	
Dichanthelium aciculare	Needleleaf witchgrass	X	X															
Dichanthelium acuminatum	Panic grass			**X**														
Dichanthelium commutatum	Variable witchgrass	X																
Digitaria ciliaris	Southern crabgrass		X															
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Diospyros virginiana	Persimmon																	
Echinochloa walteri	Coast cockspur																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X									**X**						**X**
Eragrostis elliottii	Elliot's lovegrass	X	X															
Erechtites hieraciifolius	Fireweed		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Eupatorium rotundifolium	False hoarhound		X															
Euthamia caroliniana	Slender goldenrod		X								X	X		X			X	
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X															
Galactia elliotii	Milkpea		X							X	X	X						
Gaylussacia dumosa	Dwarf huckleberry		X															
Gelsemium sempervirens	Yellow jessamine																	
Gordonia lasianthus	Loblolly bay																	
Helianthemum corymbosum	Pinebarren frostweed	X	X										X					
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross	X																
Hypericum mutilum	Dwarf St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass	X	X															
Hyptis alata	Musky mint		X															
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass													X	X			
Indigofera caroliniana	Carolina indigo	X																
Indigofera suffruticosa	Anil de pasto																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus scirpoides	Needlepod rush	X	X								X							
Lachnocaulon anceps	White-head bogbutton	X	X															
Lechea deckertii	Deckert's pinweed	X																
Lechea torreyi	Piedmont pinweed	X	X											X	X	X	X	
Lespedeza hirta	Hairy bush clover																	
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Ludwigia maritima	Seaside primrosewillow	X	X															X
Ludwigia peruviana	Primrose willow																	
Lycopodiella cernua	Nodding clubmoss																	
Lycopus rubellus	Taper-leaf bugleweed																	
Lygodesmia aphylla	Roserush	X	X															
Lyonia fruticosa	Coastplain Staggerbush		X															
Mikania scandens	Climbing hempvine																	
Mimosa quadrivalvis var. floridana	Florida sensitive brier		X															
Mimosa strigillosa	Mimosa																	
Myrica cerifera	Wax myrtle		X															
Oclemena reticulata	Whitetop aster	X																
Opuntia humifusa	Pricklypear		X													X		

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Osmunda cinnamomea	Cinnamon fern																	
Panicum hemitomon	Maidencane		X															
Paspalum notatum	Bahia grass	X						**X**										
Paspalum setaceum	Thin paspalum		X					**X**							**X**			
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal	X	X															
Pinus clausa	Sand pine																	
Pinus taeda	Loblolly pine																	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X								**X**							
Polgyala rugelii	Yellow milwort	X	X															
Polygala lutea	Orange milkwort		X															
Polygonum punctatum	Dotted smartweed		X															
Polygala setacea	coastalplain milkwort	X	X															
Polypremum procumbens	Rustweed	X											**X**					
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X															
Pterocaulon pycnostachyum	Blackroot	X	X					**X**			**X**	**X**					**X**	
Pteris vittata	Chinese ladder brake	X																
Pteroglossaspis ecrsistata	Giant orchid		X															
Quercus geminata	Sand live oak																	
Quercus laevis	Turkey oak																	
Quercus myrtifolia	Myrtle oak		X															
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X						**X**			**X**						
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac											**X**						
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora gracilenta	Slender beaksedge	X																
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia																	
Rubus argutus	Sawtooth blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Saccharum giganteum	Sugarcane plumegrass												**X**					
Sacciolepis striata	American cupscale		X															
Saururus cernuus	Lizard's tail																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria reticularis	Nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X					**D**										
Serenoa repens	Saw palmetto	X	X	**X**	**XX**					**X**	**X**							
Setaria parviflora	Knotroot bristle grass		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X										**X**					**X**
Stillingia sylvatica	Queensdelight		X															
Syngonanthus flavidulus	Bantam-buttons	X	X															
Thelypteris kunthii	Southern shield fern																	
Urena lobata	Caesarweed	X		**X**														
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X										**X**					
Vaccinium stamineum	Deerberry																	
Vitis rotundifolia	Muscadine grape																	
Woodwardia virginica	Virginia chain fern																	
Xyris elliottii	Elliott's yellow-eyed grass																	
Xyris sp.	Yellow-eyed grass	X																
	Totals	**48**	**78***															

***** Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Acer rubrum	Red maple																	
Aeschynomene americana	Meadow joint-vetch							**X**										**X**
Ambrosia artemisiifolia	Common ragweed		X															
Andropogon glomeratus	Bushy bluestem	X	X			**X**												
Andropogon virginicus	Broomsedge	X	X										**X**			**X**		
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X										**X**				**X**	
Asimina obovata	Bigflower pawpaw		X															
Asimina reticulata	Netted pawpaw		X															
Baccharis halimifolia	Eastern false-willow		X															
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	**X**
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Cephalanthus occidentalis	Buttonbush																	
Chapmannia floridana	Florida alicia		X															
Chrysopsis subulata	Scrubland goldenaster	X																
Cirsium nuttallii	Nuttall's thistle							**X**										
Cnidoscolus stimulosus	Tread-softly	X	X															
Conyza canadensis	Dwarf horseweed	X											**X**					
Coreopsis leavenworthii	Leavenworth's tickseed	X	X					**X**										
Crocanthemum corymbosum	Pinebarren frostweed																	
Croton michauxii	Rushfoil	X													**X**	**X**		
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge																	
Cyperus retrorsus	Pinebarren flatsedge	X	X															**X**
Cyperus virens	Green flatsedge																	
Dichanthelium aciculare	Needleleaf witchgrass	X	X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass	X																
Digitaria ciliaris	Southern crabgrass		X															
Digitaria serotina	Hairy crabgrass		X						**X**									
Diodia virginiana	Rough button-weed	X	X									**X**						
Diospyros virginiana	Persimmon																	
Echinochloa walteri	Coast cockspur																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X										**X**					
Eragrostis elliottii	Elliot's lovegrass	X	X											**X**	**X**			
Erechtites hieraciifolius	Fireweed		X										**X**					
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Euphorbia polyphylla	Lesser florida spurge		X															

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Eupatorium rotundifolium	False hoarhound		X															
Euthamia caroliniana	Slender goldenrod		X							**X**	**X**	**X**						**X**
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Froelichia floridana	Cottonweed	X	X													**X**		
Galactia elliotii	Milkpea		X							**X**	**X**	**X**					**X**	
Gaylussacia dumosa	Dwarf huckleberry		X															
Gelsemium sempervirens	Yellow jessamine																	
Gordonia lasianthus	Loblolly bay																	
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																**X**
Hypericum hypericoides	St. Andrews cross	X																**X**
Hypericum mutilum	Dwarf St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X										**X**					**X**
Hypoxis juncea	Yellow star grass	X	X															
Hyptis alata	Musky mint		X															
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass												**X**					
Indigofera caroliniana	Carolina indigo	X																
Indigofera suffruticosa	Anil de pasto																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Lechea deckertii	Deckert's pinweed	X																
Lechea torreyi	Piedmont pinweed	X	X															
Lespedeza hirta	Hairy bush clover																	
Lepidium virginicum	Pepper grass	X																**X**
Licania michauxii	Gopher apple		X															
Ludwigia maritima	Seaside primrosewillow	X	X									**X**						
Ludwigia peruviana	Primrose willow																	
Lycopodiella cernua	Nodding clubmoss																	
Lycopus rubellus	Taper-leaf bugleweed																	
Lygodesmia aphylla	Roserush	X	X															
Lyonia fruticosa	Coastplain Staggerbush		X															
Mikania scandens	Climbing hempvine																	
Mimosa quadrivalvis var. floridana	Florida sensitive brier		X															
Mimosa strigillosa	Mimosa																	
Myrica cerifera	Wax myrtle		X															
Oclemena reticulata	Whitetop aster	X																
Opuntia humifusa	Pricklypear		X															

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Osmunda cinnamomea	Cinnamon fern																	
Panicum hemitomon	Maidencane		X															
Paspalum notatum	Bahia grass	X																X
Paspalum setaceum	Thin paspalum		X															
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal	X	X															
Pinus clausa	Sand pine																	
Pinus taeda	Loblolly pine																	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Polgyala rugelii	Yellow milwort	X	X															
Polygala lutea	Orange milkwort		X															
Polygonum punctatum	Dotted smartweed		X															
Polygala setacea	coastalplain milkwort	X	X															
Polypremum procumbens	Rustweed	X							X			X						X
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X									X						
Pterocaulon pycnostachyum	Blackroot	X	X						X									X
Pteris vittata	Chinese ladder brake	X																
Pteroglossaspis ecrsistata	Giant orchid		X															
Quercus geminata	Sand live oak																	
Quercus laevis	Turkey oak																	
Quercus myrtifolia	Myrtle oak		X															
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X								X						X	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac									X	X							
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora gracilenta	Slender beaksedge	X																
Rhynchospora microcarpa	Southern beakrush	X																
Richardia brasiliensis	Richardia																	
Rubus argutus	Sawtooth blackberry								X									
Rubus pensilvanicus	Sawtooth blackberry																	
Saccharum giganteum	Sugarcane plumegrass																	
Sacciolepis striata	American cupscale		X															
Saururus cernuus	Lizard's tail																	
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria reticularis	Nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X						X			X						
Serenoa repens	Saw palmetto	X	X	XX	X	X	XX			X	X			X	X			
Setaria parviflora	Knotroot bristle grass		X															
Smilax auriculata	Earleaf greenbriar		X											X			X	
Smilax bona-nox	Saw greenbrier																	X

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Solidago fistulosa	Pine-barren goldenrod		X												**X**			
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Stillingia sylvatica	Queensdelight		X						**X**			**X**						
Syngonanthus flavidulus	Bantam-buttons	X	X															
Thelypteris kunthii	Southern shield fern												**X**					
Urena lobata	Caesarweed	X											**X**					
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry														**X**			
Vitis rotundifolia	Muscadine grape				**X**													
Woodwardia virginica	Virginia chain fern																	
Xyris elliottii	Elliott's yellow-eyed grass																	
Xyris sp.	Yellow-eyed grass	X											**X**					
Totals		**48**	**78***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Acer rubrum	Red maple							
Aeschynomene americana	Meadow joint-vetch							
Ambrosia artemisiifolia	Common ragweed		X					
Andropogon glomeratus	Bushy bluestem	X	X					
Andropogon virginicus	Broomsedge	X	X	**X**				
Aristida spiciformis	Pinebarren three-awn		X					
Aristida stricta	Wiregrass		X					**X**
Asimina obovata	Bigflower pawpaw		X					
Asimina reticulata	Netted pawpaw		X					
Baccharis halimifolia	Eastern false-willow		X					
Buchnera americana	American bluehearts		X					
Bulbostylis barbata	Watergrass	X		**X**			**X**	
Callicarpa americana	American beauty-berry							
Carex longii	Long's sedge		X					
Carphephorus corymbosus	Florida paintbrush		X					
Cephalanthus occidentalis	Buttonbush							
Chapmannia floridana	Florida alicia		X					
Chrysopsis subulata	Scrubland goldenaster	X						
Cirsium nuttallii	Nuttall's thistle							
Cnidoscolus stimulosus	Tread-softly	X	X					
Conyza canadensis	Dwarf horseweed	X				**X**		
Coreopsis leavenworthii	Leavenworth's tickseed	X	X					
Crocanthemum corymbosum	Pinebarren frostweed							
Croton michauxii	Rushfoil	X					**X**	
Cyperus croceus	Baldwin flatsedge	X	X					
Cyperus difformis	Variable flatsedge							
Cyperus retrorsus	Pinebarren flatsedge	X	X	**X**			**X**	
Cyperus virens	Green flatsedge							
Dichanthelium aciculare	Needleleaf witchgrass	X	X					
Dichanthelium acuminatum	Panic grass							
Dichanthelium commutatum	Variable witchgrass	X						
Digitaria ciliaris	Southern crabgrass		X					
Digitaria serotina	Hairy crabgrass		X					
Diodia virginiana	Rough button-weed	X	X					
Diospyros virginiana	Persimmon				**X**			
Echinochloa walteri	Coast cockspur							
Eleocharis baldwinii	Baldwin's spikerush		X					
Elephantopus elatus	Tall elephantsfoot		X					
Eragrostis elliottii	Elliot's lovegrass	X	X					
Erechtites hieraciifolius	Fireweed		X					
Eupatorium capillifolium	Dogfennel		X					
Eupatorium mohrii	Eupatorium		X					
Euphorbia polyphylla	Lesser florida spurge		X					

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Eupatorium rotundifolium	False hoarhound		X					
Euthamia caroliniana	Slender goldenrod		X					
Fimbristylis puberula	Vahl's hairy fringe-rush		X					
Froelichia floridana	Cottonweed	X	X					
Galactia elliotii	Milkpea		X		**X**		**X**	
Gaylussacia dumosa	Dwarf huckleberry		X					
Gelsemium sempervirens	Yellow jessamine							
Gordonia lasianthus	Loblolly bay							
Helianthemum corymbosum	Pinebarren frostweed	X	X					
Hydrocotyle umbellata	Manyflower marshpennywort		X					
Hypericum cistifolium	Round-pod St. John's wort	X						
Hypericum hypericoides	St. Andrews cross	X						
Hypericum mutilum	Dwarf St. John's-wort							
Hypericum tetrapetalum	St. John's wort	X	X					
Hypoxis juncea	Yellow star grass	X	X					
Hyptis alata	Musky mint		X					
Ilex glabra	Gallberry		X					
Imperata cylindrica	Cogon grass			**X**	**X**			
Indigofera caroliniana	Carolina indigo	X						
Indigofera suffruticosa	Anil de pasto							
Juncus effusus	Softrush							
Juncus marginatus	Grassleaf rush	X	X					
Juncus scirpoides	Needlepod rush	X	X					
Lachnocaulon anceps	White-head bogbutton	X	X					
Lechea deckertii	Deckert's pinweed	X		**X**				
Lechea torreyi	Piedmont pinweed	X	X					
Lespedeza hirta	Hairy bush clover							
Lepidium virginicum	Pepper grass	X						
Licania michauxii	Gopher apple		X					
Ludwigia maritima	Seaside primrosewillow	X	X					
Ludwigia peruviana	Primrose willow							
Lycopodiella cernua	Nodding clubmoss							
Lycopus rubellus	Taper-leaf bugleweed							
Lygodesmia aphylla	Roserush	X	X					
Lyonia fruticosa	Coastplain Staggerbush		X					
Mikania scandens	Climbing hempvine							
Mimosa quadrivalvis var. floridana	Florida sensitive brier		X					
Mimosa strigillosa	Mimosa							
Myrica cerifera	Wax myrtle		X					
Oclemena reticulata	Whitetop aster	X						
Opuntia humifusa	Pricklypear		X					

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Osmunda cinnamomea	Cinnamon fern							
Panicum hemitomon	Maidencane		X					
Paspalum notatum	Bahia grass	X						
Paspalum setaceum	Thin paspalum		X					
Phytolacca americana	Common pokeweed							
Piloblephis rigida	Wild pennyroyal	X	X					
Pinus clausa	Sand pine							
Pinus taeda	Loblolly pine							
Pityopsis graminifolia	Narrowleaf silkgrass	X	X					
Polgyala rugelii	Yellow milwort	X	X					
Polygala lutea	Orange milkwort		X					
Polygonum punctatum	Dotted smartweed		X					
Polygala setacea	coastalplain milkwort	X	X					
Polypremum procumbens	Rustweed	X						
Pteridium aquilinum	Bracken fern		X					
Pteridium aquilinum var. pseudocaudatum	Tailed bracken		X					
Pterocaulon pycnostachyum	Blackroot	X	X					
Pteris vittata	Chinese ladder brake	X						
Pteroglossaspis ecrsistata	Giant orchid		X					
Quercus geminata	Sand live oak							
Quercus laevis	Turkey oak							
Quercus myrtifolia	Myrtle oak		X					
Quercus nigra	Water oak							
Quercus pumila	Running oak		X			**X**		
Quercus virginiana	Live oak		X					
Rhexia mariana	Meadow-beauty	X	X					
Rhus copallinum	Winged sumac				**X**			
Rhynchospora fascicularis	Fasciculate beakrush	X	X					
Rhynchospora gracilenta	Slender beaksedge	X						
Rhynchospora microcarpa	Southern beakrush	X						
Richardia brasiliensis	Richardia							
Rubus argutus	Sawtooth blackberry							
Rubus pensilvanicus	Sawtooth blackberry							
Saccharum giganteum	Sugarcane plumegrass							
Sacciolepis striata	American cupscale		X					
Saururus cernuus	Lizard's tail							
Schizachyrium stoloniferum	Creeping little bluestem							
Scleria reticularis	Nutrush	X	X					
Scoparia dulcis	Licorice weed	X	X					
Serenoa repens	Saw palmetto	X	X		**X**	**X**		
Setaria parviflora	Knotroot bristle grass		X					
Smilax auriculata	Earleaf greenbriar		X					
Smilax bona-nox	Saw greenbrier				**X**			

X = occurrence within the quadrat

TABLE 40: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Solidago fistulosa	Pine-barren goldenrod		X					
Solidago odorata var. chapmanii	Chapman's goldenrod		X					
Stillingia sylvatica	Queensdelight		X					
Syngonanthus flavidulus	Bantam-buttons	X	X					
Thelypteris kunthii	Southern shield fern							
Urena lobata	Caesarweed	X			**X**			
Vaccinium corymbosum	Highbush blueberry							
Vaccinium myrsinites	Shiny blueberry		X					
Vaccinium stamineum	Deerberry							
Vitis rotundifolia	Muscadine grape							
Woodwardia virginica	Virginia chain fern							
Xyris elliottii	Elliott's yellow-eyed grass							
Xyris sp.	Yellow-eyed grass	X						
	Totals	**48**	**78***					

***** Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add
Abutilon theophrasti	Velvetleaf					X			X	X	X	X						
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X						X			X						
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Asimina reticulata	Netted pawpaw		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X					X					X					
Baccharis halimifolia	Eastern false-willow		X															
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts	X	X											X	X	X	X	
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X		X													
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X							X							X	
Chamaecrista nictitans	Wild sensitive plant		X	X						X				X	X		X	
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat			X			X			X							X	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis leavenworthii	Leavenworth's tickseed	X	X		X													
Crotalaria pallida	Smooth rattle-box	X		X														
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X									X							
Croton michauxii	Rushfoil	X	X															
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X							X	X	X						
Cyperus flavescens	Yellow flatsedge		X									X						
Cyperus lanceolatus	Epiphytic flatsedge										X							
Cyperus ligularis	Swamp flatsedge																	
Cyperus odoratus	Fragrant flatsedge		X				X											
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X	X												X		X	
Cyperus surinamensis	Tropical flatsedge	X	X										X					
Cyperus virens	Green flatsedge	X		X		X												
Desmodium incanum	Zarzabacao comun	X	X														X	
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X																

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X										X	X	X			
Digitaria longiflora	Indian crabgrass	X												X		X		
Digitaria serotina	Hairy crabgrass	X	X				X				X				X		X	
Drymaria cordata	West Indian chickweed																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X								X			X				
Eupatorium mohrii	Eupatorium		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis dichotoma	Forked fimbry	X																
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw			X			X		X			X						
Gamochaeta pensylvanica	Pennsylvania everlasting		X						X									
Helianthus angustifolius	Narrowleaf sunflower		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum hypericoides	St. Andrews cross	X	X			X												
Hypericum mutilum	Dwarf St. John's-wort	X	X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles					X							X					
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass													X	X			
Indigofera hirsuta	Hairy indigo	X						X										
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge	X						X										
Lachnocaulon anceps	White-head bogbutton		X										X					
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel										X							
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow					X				X					X			
Ludwigia repens	Red-leaf ludwigia		X															
Lygodesmia aphylla	Roserush		X															
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X							X									
Melothria pendula	Creeping cucumber							X									X	
Mikania scandens	Climbing hempvine				X						X							
Mimosa strigillosa	Mimosa					X			X		X			X			X	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X		X	X	X		X							X		
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines	X	X	X	X	X			X			X						
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum									X							X	
Panicum hemitomon	Maidencane		X															X
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper						X											
Paspalum conjugatum	Sour paspalum	X																
Paspalum floridanum	Florida paspalum		X															
Paspalum notatum	Bahia grass	X								X								
Paspalum setaceum	Thin paspalum	X	X							X				X				
Paspalum urvillei	Vaseygrass				X	X	X		X	X		X						
Phyla nodiflora	Frog-fruit	X	X							X	X							
Phyllanthus urinaria	Chamberbitter				X		X									X		
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polgyala rugelii	Yellow milwort		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		X	X	X			X	X		X						
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot	X	X						X	X		X			X			
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhynchospora fascicularis	Fasciculate beakrush		X															
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry		X															
Rubus cuneifolius	Sand Blackberry		X															
Rubus sp.	Blackberry		X															
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add
Sesbania herbacea	Danglepod		X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster																	
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy																	
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
	Totals	**69**	**90***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add
Abutilon theophrasti	Velvetleaf						X			X		X				X		
Acalypha gracilens	Slender threeseed mercury		X										X					
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine												X					
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Asimina reticulata	Netted pawpaw		X										X					
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts	X	X						X									
Bulbostylis barbata	Watergrass								X	X		X						
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X					X	X									
Chamaecrista nictitans	Wild sensitive plant		X						X	X	X	X						
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Conyza canadensis	Dwarf horseweed	X							X			X						
Coreopsis leavenworthii	Leavenworth's tickseed	X	X			X								X	X			
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X	X															
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															X
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus ligularis	Swamp flatsedge					X												
Cyperus odoratus	Fragrant flatsedge		X			X	X											
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X	X										X					
Cyperus surinamensis	Tropical flatsedge	X	X															
Cyperus virens	Green flatsedge	X								X								
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X										D					
Dichanthelium acuminatum	Panic grass	X																

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X						X	X	X	X						
Digitaria longiflora	Indian crabgrass	X																
Digitaria serotina	Hairy crabgrass	X	X							X								
Drymaria cordata	West Indian chickweed																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X								X							
Eupatorium mohrii	Eupatorium		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Euthamia caroliniana	Slender goldenrod		X															X
Fimbristylis dichotoma	Forked fimbry	X																
Galactia elliotii	Milkpea		X										X					
Galium tinctorium	Bedstraw			X	X		X				X				X			
Gamochaeta pensylvanica	Pennsylvania everlasting		X						X									
Helianthus angustifolius	Narrowleaf sunflower		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum hypericoides	St. Andrews cross	X	X															
Hypericum mutilum	Dwarf St. John's-wort	X	X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass								X		X	X						
Indigofera hirsuta	Hairy indigo	X																
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge	X											X					
Lachnocaulon anceps	White-head bogbutton		X															
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X										X					
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow				X					X		X		X		X		
Ludwigia repens	Red-leaf ludwigia		X															
Lygodesmia aphylla	Roserush		X															
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum	X	X										X					

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa			X	X					X						X		
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X		X												X	
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines	X	X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum								X	X	X	X						
Panicum hemitomon	Maidencane		X						X		X							
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper							X							X			
Paspalum conjugatum	Sour paspalum	X																
Paspalum floridanum	Florida paspalum		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X										X					
Paspalum urvillei	Vaseygrass									X								
Phyla nodiflora	Frog-fruit	X	X	X		X							X					
Phyllanthus urinaria	Chamberbitter									X								
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X							X		X							
Polgyala rugelii	Yellow milwort		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane	X											X					
Praxelis clematidea	Praxelis	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot	X	X	X	X	X			X		X	X		X	X	X	X	
Ptilimnium capillaceum	Bishop-weed	X	X				X											
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhynchospora fascicularis	Fasciculate beakrush		X															
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry		X															
Rubus cuneifolius	Sand Blackberry		X															
Rubus sp.	Blackberry		X															
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add
Sesbania herbacea	Danglepod		X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster																	
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy																	
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
	Totals	**69**	**90***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Abutilon theophrasti	Velvetleaf										X			X		X	X	
Acalypha gracilens	Slender threeseed mercury		X												X		X	
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine									X	X	X						
Amphicarpum muehlenbergianum	Blue maidencane		X							X								
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Asimina reticulata	Netted pawpaw		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle														X			
Buchnera americana	American bluehearts	X	X													X		
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X															X
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat																	
Cirsium nuttallii	Nuttall's thistle															X		
Commelina diffusa	Dayflower	X																
Conyza canadensis	Dwarf horseweed	X								X								X
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X	X															
Cuphea carthagenensis	Columbian waxweed													X			X	
Cynodon dactylon	Bermuda grass	X													X			
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X									X						
Cyperus flavescens	Yellow flatsedge		X						X									
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus ligularis	Swamp flatsedge														X			
Cyperus odoratus	Fragrant flatsedge		X							X								
Cyperus polystachyos	Manyspike flatsedge		X										X					
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X	X				X		X	X		X						
Cyperus surinamensis	Tropical flatsedge	X	X													X	X	
Cyperus virens	Green flatsedge	X											X					
Desmodium incanum	Zarzabacao comun	X	X											X		X	X	
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X						X									
Dichanthelium acuminatum	Panic grass	X																

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Dichanthelium commutatum	Variable witchgrass													X			X	
Digitaria ciliaris	Southern crabgrass	X	X											X	X			
Digitaria longiflora	Indian crabgrass	X																
Digitaria serotina	Hairy crabgrass	X	X											X		X	X	
Drymaria cordata	West Indian chickweed																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X			X			X	X		X						
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X							X		X						
Eupatorium mohrii	Eupatorium		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis dichotoma	Forked fimbry	X																
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw			X	X	X			X		X							
Gamochaeta pensylvanica	Pennsylvania everlasting		X									X			X			
Helianthus angustifolius	Narrowleaf sunflower		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X						X	X	X							
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum hypericoides	St. Andrews cross	X	X															
Hypericum mutilum	Dwarf St. John's-wort	X	X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles												X					
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass								X	X		X						X
Indigofera hirsuta	Hairy indigo	X																
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X										X					
Kummerowia striata	Japanese clover																	X
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnocaulon anceps	White-head bogbutton		X															
Lepidium virginicum	Pepper grass	X										X		X				
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow												X					
Ludwigia repens	Red-leaf ludwigia		X															
Lygodesmia aphylla	Roserush		X				X		X	X	X							
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa									X				X			X	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X								X							
Nephrolepis exaltata	Boston fern																X	
Oldenlandia uniflora	Clustered millie graines	X	X															
Opuntia humifusa	Pricklypear		X					X		X	X							
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum													X		X		
Panicum hemitomon	Maidencane		X							X		X						
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum floridanum	Florida paspalum		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X											X				
Paspalum urvillei	Vaseygrass								X			X			X			
Phyla nodiflora	Frog-fruit	X	X													X		
Phyllanthus urinaria	Chamberbitter															X		
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X									X	X			X			
Polygyala rugelii	Yellow milwort		X															
Polygonum punctatum	Dotted smartweed	X	X															X
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot	X	X						X					X	X	X	X	
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X												X			
Rhynchospora fascicularis	Fasciculate beakrush		X															
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia	X										X						
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry		X															
Rubus cuneifolius	Sand Blackberry		X															
Rubus sp.	Blackberry		X															
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Sesbania herbacea	Danglepod		X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster																	
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy																	
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
	Totals	**69**	**90***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Abutilon theophrasti	Velvetleaf				X					X				X	X			
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Asimina reticulata	Netted pawpaw		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X										X					
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															X
Centella asiatica	Asian coinwort		X															
Chamaecrista nictitans	Wild sensitive plant		X															X
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat			X														
Cirsium nuttallii	Nuttall's thistle				X													
Commelina diffusa	Dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis leavenworthii	Leavenworth's tickseed	X	X				X											
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X	X															
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus ligularis	Swamp flatsedge			X		X												
Cyperus odoratus	Fragrant flatsedge		X						X		X	X						
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X	X															
Cyperus surinamensis	Tropical flatsedge	X	X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															X
Dichanthelium acuminatum	Panic grass	X																

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															**X**
Digitaria longiflora	Indian crabgrass	X																
Digitaria serotina	Hairy crabgrass	X	X	**X**														**X**
Drymaria cordata	West Indian chickweed																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															**X**
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis dichotoma	Forked fimbry	X																
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw			**X**	**X**	**X**	**X**			**X**	**X**	**X**		**X**	**X**	**X**	**X**	
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum hypericoides	St. Andrews cross	X	X															
Hypericum mutilum	Dwarf St. John's-wort	X	X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X					**X**										
Hyptis verticillata	John Charles																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X																
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnocaulon anceps	White-head bogbutton		X															
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lygodesmia aphylla	Roserush		X															
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum	X	X															

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4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

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Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X																
Melothria pendula	Creeping cucumber										X							
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa					X												
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X	X			X		X		X							
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines	X	X						X									
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper								X									
Paspalum conjugatum	Sour paspalum	X																
Paspalum floridanum	Florida paspalum		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass			X									X					
Phyla nodiflora	Frog-fruit	X	X										X					
Phyllanthus urinaria	Chamberbitter				X													
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X		X													
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polgyala rugelii	Yellow milwort		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X								X		X						
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot	X	X		X	X								X	X	X	X	
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhynchospora fascicularis	Fasciculate beakrush		X	X					X									
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry		X															
Rubus cuneifolius	Sand Blackberry		X															
Rubus sp.	Blackberry		X															
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Sesbania herbacea	Danglepod		X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster																	
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy																	
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
	Totals	**69**	**90***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add
Abutilon theophrasti	Velvetleaf			**X**	**X**		**X**			**X**	**X**							
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Asimina reticulata	Netted pawpaw		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X				**X**											
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X	X															
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus ligularis	Swamp flatsedge										**X**			**X**	**X**			
Cyperus odoratus	Fragrant flatsedge		X			**X**												
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X	X			**X**												
Cyperus surinamensis	Tropical flatsedge	X	X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X																

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass	X																
Digitaria serotina	Hairy crabgrass	X	X															
Drymaria cordata	West Indian chickweed																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis dichotoma	Forked fimbry	X																
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw							**X**	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum hypericoides	St. Andrews cross	X	X															
Hypericum mutilum	Dwarf St. John's-wort	X	X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X																
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnocaulon anceps	White-head bogbutton		X															
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia		X															
Lygodesmia aphylla	Roserush		X															
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines	X	X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper																	
Paspalum conjugatum	Sour paspalum	X																
Paspalum floridanum	Florida paspalum		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X	**X**	**X**	**X**							**X**					
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygyala rugelii	Yellow milwort		X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot	X	X	**X**	**X**		**X**		**X**	**X**	**X**	**X**				**X**	**X**	
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhynchospora fascicularis	Fasciculate beakrush		X															
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry		X															
Rubus cuneifolius	Sand Blackberry		X															
Rubus sp.	Blackberry		X															
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
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SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add
Sesbania herbacea	Danglepod		X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster																	
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy																	
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
	Totals	**69**	**90***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
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FOUR CORNERS MINE - SUWH
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Abutilon theophrasti	Velvetleaf				X													
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine														X			
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Asimina reticulata	Netted pawpaw		X															
Axonopus fissifolius	Southern carpet grass	X	X															
Axonopus furcatus	Flat-joint carpet grass		X											X				
Baccharis halimifolia	Eastern false-willow		X				X											
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X						X	X	X	X				X		
Chamaecrista nictitans	Wild sensitive plant		X	X														X
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat										X							
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X																X
Conyza canadensis	Dwarf horseweed	X																
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						X			X						
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X	X															
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge		X															
Cyperus croceus	Baldwin flatsedge	X	X						X			X						
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus ligularis	Swamp flatsedge			X	X	X									X	X		
Cyperus odoratus	Fragrant flatsedge		X	X									X					
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X	X	X														
Cyperus surinamensis	Tropical flatsedge	X	X				X											
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X								X							
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X																

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Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X											X				
Digitaria longiflora	Indian crabgrass	X																
Digitaria serotina	Hairy crabgrass	X	X					X	X	X						X		
Drymaria cordata	West Indian chickweed																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X												X	X		
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Euthamia caroliniana	Slender goldenrod		X													X		
Fimbristylis dichotoma	Forked fimbry	X																
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw			X										X	X		X	
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthus angustifolius	Narrowleaf sunflower		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum hypericoides	St. Andrews cross	X	X															
Hypericum mutilum	Dwarf St. John's-wort	X	X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hyptis alata	Musky mint		X						X	X	X							
Hyptis verticillata	John Charles																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass							X										
Indigofera hirsuta	Hairy indigo	X																
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Kummerowia striata	Japanese clover																	
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnocaulon anceps	White-head bogbutton		X															X
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel												X					
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow								X									
Ludwigia repens	Red-leaf ludwigia		X															
Lygodesmia aphylla	Roserush		X															
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum	X	X		X													

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Macroptilium lathyroides	Phaseolus					X												
Melinis repens	Natalgrass	X																
Melothria pendula	Creeping cucumber																	X
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa				X	X	X											
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X										X	X	X	X	X	
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines	X	X										X	X				
Opuntia humifusa	Pricklypear		X															X
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum repens	Torpedo grass	X																
Parietaria floridana	Florida pellitory																	
Parthenocissus quinquefolia	Virginia creeper									X						X		
Paspalum conjugatum	Sour paspalum	X																
Paspalum floridanum	Florida paspalum		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X					X								X		
Paspalum urvillei	Vaseygrass								X			X					X	
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X						X									
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea baccharis	Rosy camphorweed	X							X									
Pluchea odorata	Sweetscent	X				X												
Polygyala rugelii	Yellow milwort		X															
Polygonum punctatum	Dotted smartweed	X	X			X												
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot	X	X		X													X
Ptilimnium capillaceum	Bishop-weed	X	X				X											
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhynchospora fascicularis	Fasciculate beakrush		X															
Rhynchospora microcarpa	Southern beakrush																	
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry		X															
Rubus cuneifolius	Sand Blackberry		X															
Rubus sp.	Blackberry		X															
Rumex hastatulus	Dock																	
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto	X	X															

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T112-QN	T112-QS	T112-QE	T112-QW	T112-Add	T113-QN	T113-QS	T113-QE	T113-QW	T113-Add	T114-QN	T114-QS	T114-QE	T114-QW	T114-Add
Sesbania herbacea	Danglepod		X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster																	
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy																	
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
	Totals	**69**	**90***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add
Abutilon theophrasti	Velvetleaf												
Acalypha gracilens	Slender threeseed mercury		X										
Aeschynomene americana	Meadow joint-vetch												
Ambrosia artemisiifolia	Common ragweed		X	X									
Ampelopsis arborea	Pepper-vine								X			X	
Amphicarpum muehlenbergianum	Blue maidencane		X										
Andropogon glomeratus	Bushy bluestem	X	X							X			
Andropogon virginicus	Broomsedge	X	X										
Aristida stricta	Wiregrass		X		X								
Asimina obovata	Bigflower pawpaw												
Asimina reticulata	Netted pawpaw		X										
Axonopus fissifolius	Southern carpet grass	X	X										
Axonopus furcatus	Flat-joint carpet grass		X										
Baccharis halimifolia	Eastern false-willow		X										
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X	X	X	X	X						
Boehmeria cylindrica	Small-spike false nettle						X						
Buchnera americana	American bluehearts	X	X										
Bulbostylis barbata	Watergrass												
Callicarpa americana	American beauty-berry		X										
Carex longii	Long's sedge	X	X										
Centella asiatica	Asian coinwort		X										
Chamaecrista nictitans	Wild sensitive plant		X										
Chamaesyce hirta	Pillpod sandmat												
Chamaesyce hyssopifolia	Hyssopleaf sandmat												
Cirsium nuttallii	Nuttall's thistle												
Commelina diffusa	Dayflower	X											
Conyza canadensis	Dwarf horseweed	X											
Coreopsis leavenworthii	Leavenworth's tickseed	X	X										
Crotalaria pallida	Smooth rattle-box	X											
Crotalaria rotundifolia	Rabbitbells	X	X										
Crotalaria spectabilis	Rattle-box	X											
Croton michauxii	Rushfoil	X	X										
Cuphea carthagenensis	Columbian waxweed												
Cynodon dactylon	Bermuda grass	X											
Cyperus compressus	Poorland flatsedge		X										
Cyperus croceus	Baldwin flatsedge	X	X			X	X			X			
Cyperus flavescens	Yellow flatsedge		X	X	X								
Cyperus lanceolatus	Epiphytic flatsedge					X	X						
Cyperus ligularis	Swamp flatsedge												
Cyperus odoratus	Fragrant flatsedge		X										
Cyperus polystachyos	Manyspike flatsedge		X	X	X	X	X			X		X	
Cyperus retrorsus	Pinebarren flatsedge	X	X										
Cyperus strigosus	Straw colored flatsedge	X	X			X							
Cyperus surinamensis	Tropical flatsedge	X	X										
Cyperus virens	Green flatsedge	X		X	X		X						
Desmodium incanum	Zarzabacao comun	X	X										
Desmodium triflorum	Beggarweed	X											
Dichanthelium aciculare	Needleleaf witchgrass		X						X	X			
Dichanthelium acuminatum	Panic grass	X											

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add
Dichanthelium commutatum	Variable witchgrass												
Digitaria ciliaris	Southern crabgrass	X	X				**X**						
Digitaria longiflora	Indian crabgrass	X											
Digitaria serotina	Hairy crabgrass	X	X			**X**	**X**						
Drymaria cordata	West Indian chickweed				**X**	**X**							
Eleocharis baldwinii	Baldwin's spikerush		X										
Elephantopus elatus	Tall elephantsfoot		X					**X**	**X**	**X**		**X**	
Emilia fosbergii	Florida tasselflower												
Emilia sonchifolia	Tasselflower	X											
Erechtites hieraciifolius	Fireweed	X	X										
Erigeron quercifolius	Oak-leaf fleabane		X										
Eupatorium capillifolium	Dogfennel		X										
Eupatorium mohrii	Eupatorium		X		**X**								
Eupatorium serotinum	Late-flowering thorough-wort							**X**		**X**		**X**	
Eustachys glauca	Saltmarsh fingergrass	X	X										
Euthamia caroliniana	Slender goldenrod		X										
Fimbristylis dichotoma	Forked fimbry	X											
Galactia elliotii	Milkpea		X										
Galium tinctorium	Bedstraw								**X**				
Gamochaeta pensylvanica	Pennsylvania everlasting		X	**X**	**X**		**X**						
Helianthus angustifolius	Narrowleaf sunflower		X					**X**	**X**				
Hydrocotyle umbellata	Manyflower marshpennywort		X	**X**									
Hypericum cistifolium	Round-pod St. John's wort		X										
Hypericum hypericoides	St. Andrews cross	X	X			**X**							
Hypericum mutilum	Dwarf St. John's-wort	X	X									**X**	
Hypericum tetrapetalum	St. John's wort	X	X										**X**
Hyptis alata	Musky mint		X										
Hyptis verticillata	John Charles												
Ilex glabra	Gallberry		X										
Imperata cylindrica	Cogon grass				**X**	**X**							
Indigofera hirsuta	Hairy indigo	X											
Juncus marginatus	Grassleaf rush	X	X										
Juncus megacephalus	Bighead rush	X	X										**X**
Juncus scirpoides	Needlepod rush	X	X										
Kummerowia striata	Japanese clover												
Kyllinga brevifolia	Shortleaf spikesedge	X											
Lachnocaulon anceps	White-head bogbutton		X										
Lepidium virginicum	Pepper grass	X											
Licania michauxii	Gopher apple		X									**X**	
Lindernia crustacea	Malaysian false pimpernel												
Lindernia grandiflora	False pimpernel		X										
Liquidambar styraciflua	Sweetgum		X										
Ludwigia maritima	Seaside primrosewillow	X	X										
Ludwigia octovalvis	Large seedbox	X											
Ludwigia peruviana	Primrose willow												
Ludwigia repens	Red-leaf ludwigia		X										
Lygodesmia aphylla	Roserush		X			**X**	**X**						
Lygodium japonicum	Japanese climbing fern												
Lythrum alatum	Winged lythrum	X	X										

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add
Macroptilium lathyroides	Phaseolus												
Melinis repens	Natalgrass	X											
Melothria pendula	Creeping cucumber							X	X	X			
Mikania scandens	Climbing hempvine												
Mimosa strigillosa	Mimosa												
Mollugo verticillata	Green carpetweed				X								
Myrica cerifera	Wax myrtle		X							X			
Nephrolepis exaltata	Boston fern						X						
Oldenlandia uniflora	Clustered millie graines	X	X										
Opuntia humifusa	Pricklypear		X						X				
Oxalis corniculata	Yellow wood sorrel	X	X										
Panicum dichotomiflorum	Fall panicum												
Panicum hemitomon	Maidencane		X										X
Panicum repens	Torpedo grass	X					X						
Parietaria floridana	Florida pellitory							X					
Parthenocissus quinquefolia	Virginia creeper												
Paspalum conjugatum	Sour paspalum	X								X			
Paspalum floridanum	Florida paspalum		X										
Paspalum notatum	Bahia grass	X						X					
Paspalum setaceum	Thin paspalum	X	X										
Paspalum urvillei	Vaseygrass												
Phyla nodiflora	Frog-fruit	X	X										
Phyllanthus urinaria	Chamberbitter												
Phytolacca americana	Common pokeweed	X											
Pinus elliottii	Slash pine		X										
Pityopsis graminifolia	Narrowleaf silkgrass	X	X										
Pluchea baccharis	Rosy camphorweed	X											
Pluchea odorata	Sweetscent	X											
Polgyala rugelii	Yellow milwort		X										
Polygonum punctatum	Dotted smartweed	X	X										
Polypremum procumbens	Rustweed	X											
Portulaca pilosa	Pink purslane	X											
Praxelis clematidea	Praxelis	X											
Pteridium aquilinum	Bracken fern		X										
Pterocaulon pycnostachyum	Blackroot	X	X										
Ptilimnium capillaceum	Bishop-weed	X	X										
Quercus virginiana	Live oak		X						X		X		
Rhexia mariana	Meadow-beauty		X										
Rhynchospora fascicularis	Fasciculate beakrush		X										
Rhynchospora microcarpa	Southern beakrush												
Richardia brasiliensis	Richardia	X		X			X						X
Richardia grandiflora	Largeflower Mexican clover					X							
Rubus argutus	Sawtooth blackberry		X			X							
Rubus cuneifolius	Sand Blackberry		X			X							
Rubus sp.	Blackberry		X			X							
Rumex hastatulus	Dock					X							
Sacciolepis indica	Glenwood grass	X				X							
Scoparia dulcis	Licorice weed	X	X			X							
Serenoa repens	Saw palmetto	X	X			X							

TABLE 41: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add
Sesbania herbacea	Danglepod		X			X							
Setaria parviflora	Knotroot bristle grass	X	X			X							
Sida rhombifolia	Indian hemp		X			X							
Smilax bona-nox	Saw greenbrier					X							
Solanum viarum	Tropical soda apple					X							
Solidago fistulosa	Pine-barren goldenrod		X			X							
Solidago sempervirens	Seaside goldenrod					X							
Spermacoce verticillata	Shrubby false buttonweed	X				X							
Sporobolus indicus	Smutgrass	X				X							
Symphyotrichum bahamense	Annual saltmarsh aster					X							
Thelypteris interrupta	Shield fern					X							
Thelypteris kunthii	Southern shield fern					X							
Tillandsia usneoides	Spanish moss		X			X							
Toxicodendron radicans	Poison ivy					X							
Urena lobata	Caesarweed	X				X							
Vaccinium corymbosum	Highbush blueberry					X							
Vaccinium myrsinites	Shiny blueberry		X			X							
Vicia acutifolia	Four-leaf vetch					X							
Wahlenbergia marginata	Southern rockbell	X				X							
Woodwardia areolata	Netted chain fern					X							
Woodwardia virginica	Virginia chain fern					X							
Xyris sp.	Yellow-eyed grass	X	X			X							
Totals		**69**	**90***										

* Total number of HCPMRM List Species observed since monitoring started

TABLE 42: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T74-QN	T74-QS	T74-QE	T74-QW	T74-Add	T75-QN	T75-QS	T75-QE	T75-QW	T75-Add	T76-QN	T76-QS	T76-QE	T76-QW	T76-Add
Acer rubrum	Red maple		X					X										
Aeschynomene americana	Meadow joint-vetch																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X	X		X	X											
Andropogon virginicus	Broomsedge	X	X					X	X			X		X	X	X	X	
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X					X										
Boehmeria cylindrica	Small-spike false nettle							X										
Buchnera americana	American bluehearts	X	X										X					
Bulbostylis barbata	Watergrass																	
Callisia ornata	Florida scrub roseling		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X		X		X											
Chamaecrista nictitans	Wild sensitive plant		X															
Cirsium nuttallii	Nuttall's thistle			X	X													
Commelina diffusa	Dayflower																	
Commelina erecta	Sandhill dayflower		X															
Conyza canadensis	Dwarf horseweed																	
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria rotundifolia	Rabbitbells	X	X										X					
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X											X				
Cyperus flavescens	Yellow flatsedge		X															
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X										X				X	
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X									X	X						
Digitaria ciliaris	Southern crabgrass		X															
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed							X										
Elephantopus elatus	Tall elephantsfoot		X															X
Erechtites hieraciifolius	Fireweed		X					X										
Eupatorium capillifolium	Dogfennel		X					X										
Eupatorium mohrii	Eupatorium		X															
Euthamia caroliniana	Slender goldenrod		X		X				X		X			X	X	X	X	
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Galactia elliotii	Milkpea		X															

X = occurence within the quadrat

TABLE 42: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T74-QN	T74-QS	T74-QE	T74-QW	T74-Add	T75-QN	T75-QS	T75-QE	T75-QW	T75-Add	T76-QN	T76-QS	T76-QE	T76-QW	T76-Add
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine		X															
Helenium pinnatifidum	Southeastern sneezeweed		X									**X**						
Helianthemum corymbosum	Pinebarren frostweed		X															
Helianthus angustifolius	Narrowleaf sunflower	X	X				**X**											
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum mutilum	Dwarf St. John's-wort		X															
Hypericum tetrapetalum	St. John's wort		X										X	X				
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X								**X**					**X**	**X**		
Ipomoea sagittata	Arrow-leaf morning glory																	
Iris hexagona	Iris																	
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X		**X**	**X**	**X**								**X**	**X**		
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush	X	X															
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lachnocaulon anceps	White-head bogbutton		X															
Licania michauxii	Gopher apple		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X					X									X	
Ludwigia octovalvis	Large seedbox																	
Lygodesmia aphylla	Roserush		X															
Macroptilium lathyroides	Phaseolus																	
Magnolia virginiana	Sweetbay																	
Melinis repens	Natalgrass																	
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa																	
Myrica cerifera	Wax myrtle		X					**X**										
Osmunda cinnamomea	Cinnamon fern																	
Osmunda regalis	Royal fern																	
Oxalis corniculata	Yellow wood sorrel	X	X				X											
Panicum hemitomon	Maidencane		X	**X**		**X**	**X**											
Panicum rigidulum	Red-top panic grass	X	X															
Parthenocissus quinquefolia	Virginia creeper																	
Paspalum conjugatum	Sour paspalum	X			**X**													
Paspalum notatum	Bahia grass	X							**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	

X = occurence within the quadrat

TABLE 42: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T74-QN	T74-QS	T74-QE	T74-QW	T74-Add	T75-QN	T75-QS	T75-QE	T75-QW	T75-Add	T76-QN	T76-QS	T76-QE	T76-QW	T76-Add
Paspalum setaceum	Thin paspalum		X															
Phyla nodiflora	Frog-fruit		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea odorata	Sweetscent	X						X										
Pluchea rosea	Rosy camphorweed		X															
Polgyala rugelii	Yellow milwort		X															
Polygonum lapathifolium	Pale smartweed		X															
Polygonum punctatum	Dotted smartweed		X															
Polypremum procumbens	Rustweed	X											**X**	**X**			**X**	
Praxelis clematidea	Praxelis																	
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X										**X**					
Ptilimnium capillaceum	Bishop-weed	X	X					X										
Quercus nigra	Water oak		X					**X**										
Quercus pumila	Running oak		X															
Quercus virginiana	Live oak		X					**X**										
Rhexia mariana	Meadow-beauty	X	X											**X**				
Rhus copallinum	Winged sumac		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X	X	X	X	X											
Rhynchospora microcarpa	Southern beakrush																	
Rhynchospora nitens	Shortbeak beaksedge		X															
Richardia brasiliensis	Richardia																	
Rumex hastatulus	Dock																	
Sabatia grandiflora	Marsh pink		X															
Sacciolepis indica	Glenwood grass																	
Sagittaria lancifolia	Bulltongue arrowhead	X						X										
Scoparia dulcis	Licorice weed	X	X											**X**	**X**		**X**	
Scutellaria integrifolia	Helmet skullcap		X															
Serenoa repens	Saw palmetto		X															
Setaria parviflora	Knotroot bristle grass	X	X					**X**										
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solidago fistulosa	Pine-barren goldenrod		X			**X**												
Solidago sempervirens	Seaside goldenrod							**X**										
Spartina bakeri	Sand cordgrass		X					**X**										
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tripsacum dactyloides	Fakahatchee grass							**X**										
Urena lobata	Caesarweed	X		**X**	**X**													**X**

X = occurence within the quadrat

TABLE 42: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T74-QN	T74-QS	T74-QE	T74-QW	T74-Add	T75-QN	T75-QS	T75-QE	T75-QW	T75-Add	T76-QN	T76-QS	T76-QE	T76-QW	T76-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Viburnum obovatum	Walter's viburnum																	
Vigna luteola	Hairypod cowpea							**X**										
Vitis shuttleworthii	Calloose grape		X															
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern							**X**										
Xyris caroliniana	Carolina yelloweyed grass		X															
Xyris sp.	Yellow-eyed grass	X	X					**X**										
Totals		**29**	**91***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurence within the quadrat

TABLE 43: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T70-QN	T70-QS	T70-QE	T70-QW	T70-Add	T71-QN	T71-QS	T71-QE	T71-QW	T71-Add	T72-QN	T72-QS	T72-QE	T72-QW	T72-Add
Acer rubrum	Red maple		X															
Andropogon glomeratus	Bushy bluestem	X	X		**X**		**X**							**X**				
Andropogon virginicus	Broomsedge	X	X					X	X		X	X						X
Aristida stricta	Wiregrass		X															
Aristida stricta var. beyrichiana	Pineland three-awn																	
Asclepias pedicallata	Savannah milkweed		X															
Asimina obovata	Bigflower pawpaw									**X**								
Asimina reticulata	Netted pawpaw		X															
Baccharis halimifolia	Eastern false-willow		X															X
Callicarpa americana	American beauty-berry		X															
Centella asiatica	Asian coinwort		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Eriocaulon decangulare	Ten-angle pipewort	X												**X**				
Eupatorium capillifolium	Dogfennel		X		**X**													
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound		X															
Eupatorium serotinum	Late-flowering thorough-wort					**X**												
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X											X				
Galactia elliotii	Milkpea		X															
Gaylussacia frondosa	Blue huckleberry		X															
Gelsemium sempervirens	Yellow jessamine		X															
Gordonia lasianthus	Loblolly bay																	
Hypericum cistifolium	Round-pod St. John's wort	X	X											X			**X**	
Hypericum mutilum	Dwarf St. John's-wort		X															
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry		X												**X**	**X**		
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo																	
Juncus effusus	Softrush	X	X					**X**										
Juncus marginatus	Grassleaf rush	X	X															**X**
Juncus megacephalus	Bighead rush	X	X					**X**										
Juncus polycephalus	Manyhead rush		X															
Juncus scirpoides	Needlepod rush	X	X															
Lachnocaulon anceps	White-head bogbutton		X															

x = occurence within the quadrat

TABLE 43: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T70-QN	T70-QS	T70-QE	T70-QW	T70-Add	T71-QN	T71-QS	T71-QE	T71-QW	T71-Add	T72-QN	T72-QS	T72-QE	T72-QW	T72-Add
Ludwigia octovalvis	Large seedbox	X																
Lygodesmia aphylla	Roserush		X															
Lyonia ferruginea	Rusty lyonia		X															
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X	X		**X**													
Melinis repens	Natalgrass																	
Mikania scandens	Climbing hempvine																	
Mimosa quadrivalvis var. floridana	Florida sensitive brier		X															
Mimosa strigillosa	Mimosa																	
Myrica cerifera	Wax myrtle		X							**X**					**X**			
Osmunda cinnamomea	Cinnamon fern									**X**	**X**							**X**
Osmunda regalis	Royal fern																	
Paspalum setaceum	Thin paspalum		X															
Persea borbonia	Red bay																	
Pinus clausa	Sand pine																	
Pinus elliottii	Slash pine		X															
Pinus taeda	Loblolly pine																	
Polgyala rugelii	Yellow milwort	X	X															
Polygonum lapathifolium	Pale smartweed		X															
Polygonum punctatum	Dotted smartweed	X	X	**X**														
Polypremum procumbens	Rustweed																	
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken																	
Pterocaulon pycnostachyum	Blackroot		X															
Quercus laurifolia	Laurel oak		X															
Quercus nigra	Water oak		X															
Rhexia mariana	Meadow-beauty	X	X															**X**
Rhus copallinum	Winged sumac		X															**X**
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rubus pensilvanicus	Sawtooth blackberry																	
Scoparia dulcis	Licorice weed		X															
Serenoa repens	Saw palmetto	X	X					**X**										
Setaria parviflora	Knotroot bristle grass	X	X					**X**										
Smilax auriculata	Earleaf greenbriar		X															**X**
Smilax bona-nox	Saw greenbrier																	
Solidago fistulosa	Pine-barren goldenrod		X	**X**	**X**	**X**			**X**									**X**
Stillingia sylvatica	Queensdelight		X															
Syngonanthus flavidulus	Bantam-buttons	X	X															**X**
Urena lobata	Caesarweed	X																**X**
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X									**X**		**X**	**X**		**X**	
Vitis rotundifolia	Muscadine grape		X			**X**	**X**			**X**	**X**							
Woodwardia virginica	Virginia chain fern					**X**	**X**							**X**	**X**	**X**	**X**	
Xyris sp.	Yellow-eyed grass	X	X						**X**			**X**				**X**		
	Totals	**22**	**63***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within the quadrat

TABLE 43: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T73-QN	T73-QS	T73-QE	T73-QW	T73-Add
Acer rubrum	Red maple		X					
Andropogon glomeratus	Bushy bluestem	X	X	**X**				
Andropogon virginicus	Broomsedge	X	X		X	X	X	
Aristida stricta	Wiregrass		X					
Aristida stricta var. beyrichiana	Pineland three-awn							
Asclepias pedicallata	Savannah milkweed		X					
Asimina obovata	Bigflower pawpaw							
Asimina reticulata	Netted pawpaw		X					
Baccharis halimifolia	Eastern false-willow		X				X	
Callicarpa americana	American beauty-berry		X					
Centella asiatica	Asian coinwort		X					
Coreopsis leavenworthii	Leavenworth's tickseed	X	X					
Cyperus retrorsus	Pinebarren flatsedge	X	X					
Dichanthelium aciculare	Needleleaf witchgrass		X					
Dichanthelium acuminatum	Panic grass							
Eleocharis baldwinii	Baldwin's spikerush		X					
Elephantopus elatus	Tall elephantsfoot		X					
Eriocaulon decangulare	Ten-angle pipewort	X						
Eupatorium capillifolium	Dogfennel		X	**X**				
Eupatorium mohrii	Eupatorium		X					
Eupatorium rotundifolium	False hoarhound		X					
Eupatorium serotinum	Late-flowering thorough-wort							
Eustachys glauca	Saltmarsh fingergrass		X					
Euthamia caroliniana	Slender goldenrod		X					
Galactia elliotii	Milkpea		X					
Gaylussacia frondosa	Blue huckleberry		X					
Gelsemium sempervirens	Yellow jessamine		X					
Gordonia lasianthus	Loblolly bay							
Hypericum cistifolium	Round-pod St. John's wort	X	X					
Hypericum mutilum	Dwarf St. John's-wort		X					
Hypericum tetrapetalum	St. John's wort	X	X					
Hypoxis juncea	Yellow star grass		X					
Ilex cassine	Dahoon holly							
Ilex glabra	Gallberry		X					
Imperata cylindrica	Cogon grass							
Indigofera hirsuta	Hairy indigo							
Juncus effusus	Softrush	X	X					
Juncus marginatus	Grassleaf rush	X	X					
Juncus megacephalus	Bighead rush	X	X					
Juncus polycephalus	Manyhead rush		X					
Juncus scirpoides	Needlepod rush	X	X					
Lachnocaulon anceps	White-head bogbutton		X					

x = occurence within the quadrat

TABLE 43: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T73-QN	T73-QS	T73-QE	T73-QW	T73-Add
Ludwigia octovalvis	Large seedbox	X						
Lygodesmia aphylla	Roserush		X					
Lyonia ferruginea	Rusty lyonia		X					
Lyonia fruticosa	Coastplain Staggerbush		X					
Lyonia lucida	Fetterbush		X					
Lythrum alatum	Winged lythrum	X	X					
Melinis repens	Natalgrass							
Mikania scandens	Climbing hempvine			**X**				
Mimosa quadrivalvis var. floridana	Florida sensitive brier		X					
Mimosa strigillosa	Mimosa							
Myrica cerifera	Wax myrtle		X					
Osmunda cinnamomea	Cinnamon fern							
Osmunda regalis	Royal fern							
Paspalum setaceum	Thin paspalum		X					
Persea borbonia	Red bay							
Pinus clausa	Sand pine							
Pinus elliottii	Slash pine		X					
Pinus taeda	Loblolly pine							
Polgyala rugelii	Yellow milwort	X	X					
Polygonum lapathifolium	Pale smartweed		X					
Polygonum punctatum	Dotted smartweed	X	X					
Polypremum procumbens	Rustweed							
Pteridium aquilinum	Bracken fern		X					
Pteridium aquilinum var. pseudocaudatum	Tailed bracken							
Pterocaulon pycnostachyum	Blackroot		X					
Quercus laurifolia	Laurel oak		X					
Quercus nigra	Water oak		X					
Rhexia mariana	Meadow-beauty	X	X					
Rhus copallinum	Winged sumac		X					
Rhynchospora fascicularis	Fasciculate beakrush	X	X	**X**			**X**	
Rubus pensilvanicus	Sawtooth blackberry							
Scoparia dulcis	Licorice weed		X					
Serenoa repens	Saw palmetto	X	X		**X**			
Setaria parviflora	Knotroot bristle grass	X	X					
Smilax auriculata	Earleaf greenbriar		X					
Smilax bona-nox	Saw greenbrier							**X**
Solidago fistulosa	Pine-barren goldenrod		X			**X**		
Stillingia sylvatica	Queensdelight		X					
Syngonanthus flavidulus	Bantam-buttons	X	X					
Urena lobata	Caesarweed	X						
Vaccinium corymbosum	Highbush blueberry							
Vaccinium myrsinites	Shiny blueberry		X					
Vaccinium stamineum	Deerberry		X					
Vitis rotundifolia	Muscadine grape		X					
Woodwardia virginica	Virginia chain fern			**X**	**X**	**X**	**X**	
Xyris sp.	Yellow-eyed grass	X	X			**X**		
	Totals	**22**	**63***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T114-QN	T114-QS	T114-QE	T114-QW	T114-Add	T115-QN	T115-QS	T115-QE	T115-QW	T115-Add	T116-QN	T116-QS	T116-QE	T116-QW	T116-Add
Acer rubrum	Red maple		X															
Aeschynomene americana	Meadow joint-vetch																X	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove	X																
Alysicarpus ovalifolius	False moneywort	X								X	X			X	X	X	X	
Ambrosia artemisiifolia	Common ragweed		X															
Andropogon glomeratus	Bushy bluestem	X																
Andropogon virginicus	Broomsedge	X	X	X	X	X												
Asclepias pedicallata	Savannah milkweed																	
Axonopus fissifolius	Southern carpet grass																	
Baccharis halimifolia	Eastern false-willow		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X							X	X		X		X				
Carex longii	Long's sedge		X															
Centella asiatica	Asian coinwort		X	X			X											
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X												X				
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X	X															
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X									X							
Coreopsis leavenworthii	Leavenworth's tickseed	X				X												
Crotalaria pallida	Smooth rattle-box	X																
Croton glandulosus	Vente conmigo																	
Cynodon dactylon	Bermuda grass	X										X		X	X	X		
Cyperus compressus	Poorland flatsedge																	
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass	X																
Cyperus strigosus	Straw colored flatsedge																	
Cyperus surinamensis	Tropical flatsedge																	
Cyperus virens	Green flatsedge																	
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X										X			X	X	
Digitaria serotina	Hairy crabgrass	X	X															
Drymaria cordata	West Indian chickweed		X															
Echinochloa walteri	Coast cockspur																	
Eclipta prostrata	Upright burhead																	
Emilia fosbergii	Florida tasselflower																	
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X			X												X
Eustachys glauca	Saltmarsh fingergrass																	
Euthamia caroliniana	Slender goldenrod																	
Fimbristylis autumnalis	Fringe-rush																	
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X	X	X	X	X											

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T114-QN	T114-QS	T114-QE	T114-QW	T114-Add	T115-QN	T115-QS	T115-QE	T115-QW	T115-Add	T116-QN	T116-QS	T116-QE	T116-QW	T116-Add
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid																	
Hydrocotyle umbellata	Manyflower marshpennywort		X					X										
Hypericum cistifolium	Round-pod St. John's wort																	
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X								**X**		**X**						
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X			X													
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush	X			**X**		**X**											
Lepidium virginicum	Pepper grass	X																
Ludwigia maritima	Seaside primrosewillow																	
Ludwigia octovalvis	Large seedbox																	
Ludwigia peruviana	Primrose willow																	
Lygodium japonicum	Japanese climbing fern					X												
Lythrum alatum	Winged lythrum			**X**			**X**											
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X														**X**		
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed								**X**							**X**		
Myrica cerifera	Wax myrtle		X	**X**			**X**											
Oenothera laciniata	Cutleaf evening primrose																	

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T114-QN	T114-QS	T114-QE	T114-QW	T114-Add	T115-QN	T115-QS	T115-QE	T115-QW	T115-Add	T116-QN	T116-QS	T116-QE	T116-QW	T116-Add
Oxalis corniculata	Yellow wood sorrel	X	X															X
Panicum hemitomon	Maidencane		X															
Panicum maximum	Guineagrass	X																
Parthenocissus quinquefolia	Virginia creeper		X															
Paspalum notatum	Bahia grass	X															**X**	
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Persea borbonia	Red bay		X															
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed	X																X
Pinus elliottii	Slash pine		X															
Pluchea odorata	Sweetscent																	
Pluchea rosea	Rosy camphorweed																	
Polygonum punctatum	Dotted smartweed																	
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane	X							X									
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot							X										
Ptilimnium capillaceum	Bishop-weed	X	X				**X**											
Rhexia mariana	Meadow-beauty																	
Rhynchospora fascicularis	Fasciculate beakrush	X		**X**	**X**													
Richardia brasiliensis	Richardia													**X**				
Rubus argutus	Sawtooth blackberry		X															
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass																	
Sacciolepis striata	American cupscale																	
Sagittaria lancifolia	Bulltongue arrowhead																	
Salix caroliniana	Southern willow																	
Scleria ciliata var. ciliata	Fringed nutrush																	
Scoparia dulcis	Licorice weed	X	X						X	X								X
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X														X		
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod				X													
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern		X	X		X	X											
Tillandsia usneoides	Spanish moss		X															
Urena lobata	Caesarweed	X																
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry		X															
Vitis rotundifolia	Muscadine grape		X															
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern							X										
Xyris sp.	Yellow-eyed grass	X																
	Totals	**44**	**42***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECL
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add	T119-QN	T119-QS	T119-QE	T119-QW	T119-Add
Acer rubrum	Red maple		X															
Aeschynomene americana	Meadow joint-vetch						X						X					
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove	X																
Alysicarpus ovalifolius	False moneywort	X																
Ambrosia artemisiifolia	Common ragweed		X						X					X	X			
Andropogon glomeratus	Bushy bluestem	X										X						
Andropogon virginicus	Broomsedge	X	X										X	X	X	X		
Asclepias pedicallata	Savannah milkweed																	
Axonopus fissifolius	Southern carpet grass																	
Baccharis halimifolia	Eastern false-willow		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X	X	X	X												
Boehmeria cylindrica	Small-spike false nettle																	
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Carex longii	Long's sedge		X															
Centella asiatica	Asian coinwort		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Cirsium horridulum	Thistle																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X	X						X									
Commelina gambiae	Gambian dayflower	X											X					
Conyza canadensis	Dwarf horseweed	X																X
Coreopsis leavenworthii	Leavenworth's tickseed	X							X					X	X	X	X	
Crotalaria pallida	Smooth rattle-box	X							X					X				
Croton glandulosus	Vente conmigo																	
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge																	
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X									X							
Cyperus retrorsus	Pinebarren flatsedge	X	X										X					
Cyperus rotundus	Nutgrass	X																
Cyperus strigosus	Straw colored flatsedge																	
Cyperus surinamensis	Tropical flatsedge																	
Cyperus virens	Green flatsedge																	
Desmodium incanum	Zarzabacao comun	X	X						X									
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X	X	X	X					X							
Digitaria serotina	Hairy crabgrass	X	X									X						
Drymaria cordata	West Indian chickweed		X															
Echinochloa walteri	Coast cockspur																	
Eclipta prostrata	Upright burhead																	
Emilia fosbergii	Florida tasselflower																	
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															X
Eupatorium capillifolium	Dogfennel		X		X							X					X	
Eustachys glauca	Saltmarsh fingergrass																	
Euthamia caroliniana	Slender goldenrod										X							
Fimbristylis autumnalis	Fringe-rush																	
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X						X	X		X						X

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECL
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add	T119-QN	T119-QS	T119-QE	T119-QW	T119-Add
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort																	
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass														**X**			
Indigofera hirsuta	Hairy indigo	X						**X**										
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X											X		X		X	
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush	X								**X**								
Lepidium virginicum	Pepper grass	X																
Ludwigia maritima	Seaside primrosewillow																	
Ludwigia octovalvis	Large seedbox																	
Ludwigia peruviana	Primrose willow																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum														**X**	**X**		
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass	X											**X**	**X**				
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed																	
Myrica cerifera	Wax myrtle		X															**X**
Oenothera laciniata	Cutleaf evening primrose																	

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECL
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T117-QN	T117-QS	T117-QE	T117-QW	T117-Add	T118-QN	T118-QS	T118-QE	T118-QW	T118-Add	T119-QN	T119-QS	T119-QE	T119-QW	T119-Add
Oxalis corniculata	Yellow wood sorrel	X	X										**X**					
Panicum hemitomon	Maidencane		X									**X**						
Panicum maximum	Guineagrass	X																
Parthenocissus quinquefolia	Virginia creeper		X															
Paspalum notatum	Bahia grass	X						**X**										
Paspalum setaceum	Thin paspalum		X	X														
Paspalum urvillei	Vaseygrass	X							**X**		**X**							
Persea borbonia	Red bay		X															
Phyllanthus urinaria	Chamberbitter							X										
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pluchea odorata	Sweetscent																	
Pluchea rosea	Rosy camphorweed																	
Polygonum punctatum	Dotted smartweed																	
Polypremum procumbens	Rustweed	X								**X**							**X**	
Portulaca pilosa	Pink purslane	X																
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot												X					
Ptilimnium capillaceum	Bishop-weed	X	X						**X**									**X**
Rhexia mariana	Meadow-beauty																	
Rhynchospora fascicularis	Fasciculate beakrush	X																
Richardia brasiliensis	Richardia																	
Rubus argutus	Sawtooth blackberry		X															
Rumex hastatulus	Dock																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass																	
Sacciolepis striata	American cupscale																	
Sagittaria lancifolia	Bulltongue arrowhead																	
Salix caroliniana	Southern willow																	
Scleria ciliata var. ciliata	Fringed nutrush																	
Scoparia dulcis	Licorice weed	X	X						X		X			X				
Serenoa repens	Saw palmetto	X	X															
Sesbania herbacea	Danglepod				X													
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X			X				**X**								X	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															X
Solidago sempervirens	Seaside goldenrod													X				
Spermacoce verticillata	Shrubby false buttonweed	X								X								
Sporobolus indicus	Smutgrass	X																
Thelypteris interrupta	Shield fern																	
Thelypteris kunthii	Southern shield fern		X															
Tillandsia usneoides	Spanish moss		X															
Urena lobata	Caesarweed	X		X		X	X		**X**							X	X	
Urochloa mutica	Paragrass																	
Vaccinium corymbosum	Highbush blueberry		X															
Vitis rotundifolia	Muscadine grape		X															
Wahlenbergia marginata	Southern rockbell	X																
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern									X								
Xyris sp.	Yellow-eyed grass	X																
	Totals	**44**	**42***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECL
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T120-QN	T120-QS	T120-QE	T120-QW	T120-Add
Acer rubrum	Red maple		X					
Aeschynomene americana	Meadow joint-vetch				X			
Aeschynomene indica	India joint-vetch							
Agalinis fasciculata	Beach False-foxglove	X						
Alysicarpus ovalifolius	False moneywort	X		**X**				
Ambrosia artemisiifolia	Common ragweed		X					
Andropogon glomeratus	Bushy bluestem	X						
Andropogon virginicus	Broomsedge	X	X					
Asclepias pedicallata	Savannah milkweed							
Axonopus fissifolius	Southern carpet grass							
Baccharis halimifolia	Eastern false-willow		X					
Begonia cucullata	Wax begonia							
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X					
Boehmeria cylindrica	Small-spike false nettle							
Buchnera americana	American bluehearts		X					
Bulbostylis barbata	Watergrass	X						
Carex longii	Long's sedge		X					
Centella asiatica	Asian coinwort		X					
Chamaesyce hirta	Pillpod sandmat							
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X						
Cirsium horridulum	Thistle							
Cirsium nuttallii	Nuttall's thistle	X						
Commelina diffusa	Dayflower	X	X					
Commelina gambiae	Gambian dayflower	X						
Conyza canadensis	Dwarf horseweed	X						
Coreopsis leavenworthii	Leavenworth's tickseed	X						
Crotalaria pallida	Smooth rattle-box	X						**X**
Croton glandulosus	Vente conmigo							
Cynodon dactylon	Bermuda grass	X					**X**	
Cyperus compressus	Poorland flatsedge							
Cyperus croceus	Baldwin flatsedge	X	X					
Cyperus flavescens	Yellow flatsedge							
Cyperus haspan	Haspan flatsedge	X						
Cyperus retrorsus	Pinebarren flatsedge	X	X					
Cyperus rotundus	Nutgrass	X			X	X		
Cyperus strigosus	Straw colored flatsedge							
Cyperus surinamensis	Tropical flatsedge							
Cyperus virens	Green flatsedge							
Desmodium incanum	Zarzabacao comun	X	X					
Desmodium triflorum	Beggarweed							
Dichanthelium aciculare	Needleleaf witchgrass							
Digitaria ciliaris	Southern crabgrass	X	X	X	X	X	X	
Digitaria serotina	Hairy crabgrass	X	X					
Drymaria cordata	West Indian chickweed		X					
Echinochloa walteri	Coast cockspur							
Eclipta prostrata	Upright burhead							
Emilia fosbergii	Florida tasselflower							
Erechtites hieraciifolius	Fireweed		X					
Erigeron quercifolius	Oak-leaf fleabane	X	X					
Eupatorium capillifolium	Dogfennel		X					
Eustachys glauca	Saltmarsh fingergrass							
Euthamia caroliniana	Slender goldenrod							**X**
Fimbristylis autumnalis	Fringe-rush							
Fuirena pumila	Umbrella-sedge							
Galactia elliotii	Milkpea		X					

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECL
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T120-QN	T120-QS	T120-QE	T120-QW	T120-Add
Gelsemium sempervirens	Yellow jessamine		X					
Habenaria repens	Water-spider orchid							
Hydrocotyle umbellata	Manyflower marshpennywort		X					
Hypericum cistifolium	Round-pod St. John's wort							
Hyptis alata	Musky mint		X					
Hyptis verticillata	John Charles							X
Imperata cylindrica	Cogon grass							
Indigofera hirsuta	Hairy indigo	X		**X**				
Juncus effusus	Softrush							
Juncus marginatus	Grassleaf rush	X						
Juncus megacephalus	Bighead rush							
Juncus scirpoides	Needlepod rush	X						
Lepidium virginicum	Pepper grass	X						
Ludwigia maritima	Seaside primrosewillow							
Ludwigia octovalvis	Large seedbox							
Ludwigia peruviana	Primrose willow							
Lygodium japonicum	Japanese climbing fern							
Lythrum alatum	Winged lythrum							
Macroptilium lathyroides	Phaseolus							
Melinis repens	Natalgrass	X		**X**	**X**	**X**		
Mikania scandens	Climbing hempvine							
Mollugo verticillata	Green carpetweed			**X**		**X**		
Myrica cerifera	Wax myrtle		X					
Oenothera laciniata	Cutleaf evening primrose							

x = occurrence within the quadrat

TABLE 44: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECL
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T120-QN	T120-QS	T120-QE	T120-QW	T120-Add
Oxalis corniculata	Yellow wood sorrel	X	X					
Panicum hemitomon	Maidencane		X					
Panicum maximum	Guineagrass	X						
Parthenocissus quinquefolia	Virginia creeper		X					
Paspalum notatum	Bahia grass	X						
Paspalum setaceum	Thin paspalum		X					
Paspalum urvillei	Vaseygrass	X						
Persea borbonia	Red bay		X					
Phyllanthus urinaria	Chamberbitter							
Phytolacca americana	Common pokeweed	X						
Pinus elliottii	Slash pine		X					
Pluchea odorata	Sweetscent							
Pluchea rosea	Rosy camphorweed							
Polygonum punctatum	Dotted smartweed							
Polypremum procumbens	Rustweed	X						
Portulaca pilosa	Pink purslane	X						
Pteridium aquilinum	Bracken fern		X					
Pterocaulon pycnostachyum	Blackroot							
Ptilimnium capillaceum	Bishop-weed	X	X					
Rhexia mariana	Meadow-beauty							
Rhynchospora fascicularis	Fasciculate beakrush	X						
Richardia brasiliensis	Richardia					**X**		
Rubus argutus	Sawtooth blackberry		X					
Rumex hastatulus	Dock							
Sabal palmetto	Cabbage palm		X					
Sacciolepis indica	Glenwood grass							
Sacciolepis striata	American cupscale							
Sagittaria lancifolia	Bulltongue arrowhead							
Salix caroliniana	Southern willow							
Scleria ciliata var. ciliata	Fringed nutrush							
Scoparia dulcis	Licorice weed	X	X					X
Serenoa repens	Saw palmetto	X	X					X
Sesbania herbacea	Danglepod							
Sesbania vesicaria	Bladderpod							
Setaria parviflora	Knotroot bristle grass	X						
Sida rhombifolia	Indian hemp		X					
Smilax auriculata	Earleaf greenbriar		X					
Solanum viarum	Tropical soda apple							
Solidago fistulosa	Pine-barren goldenrod		X					
Solidago sempervirens	Seaside goldenrod							
Spermacoce verticillata	Shrubby false buttonweed	X						
Sporobolus indicus	Smutgrass	X						
Thelypteris interrupta	Shield fern							
Thelypteris kunthii	Southern shield fern		X					
Tillandsia usneoides	Spanish moss		X					
Urena lobata	Caesarweed	X			X	X	X	
Urochloa mutica	Paragrass							
Vaccinium corymbosum	Highbush blueberry		X					
Vitis rotundifolia	Muscadine grape		X					
Wahlenbergia marginata	Southern rockbell	X						
Woodwardia areolata	Netted chain fern							
Woodwardia virginica	Virginia chain fern							
Xyris sp.	Yellow-eyed grass	X						
	Totals	**44**	**42***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within the quadrat

TABLE 45: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add	T112-QN	T112-QS	T112-QE	T112-QW	T112-Add	T113-QN	T113-QS	T113-QE	T113-QW	T113-Add
Acer rubrum	Red maple		X				**X**											**X**
Ambrosia artemisiifolia	Common ragweed		X															
Andropogon glomeratus	Bushy bluestem	X																
Andropogon virginicus	Broomsedge	X	X					**X**	**X**							**X**		
Asimina reticulata	Netted pawpaw																	
Axonopus furcatus	Flat-joint carpet grass	X																
Baccharis halimifolia	Eastern false-willow		X															
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Boehmeria cylindrica	Small-spike false nettle	X																
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X															
Chasmanthium laxum	Slender spikegrass		X															
Commelina diffusa	Dayflower	X	X															
Commelina erecta	Sandhill dayflower																	
Conyza canadensis	Dwarf horseweed																	
Cuphea carthagenensis	Columbian waxweed	X																
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Dichanthelium aciculare	Needleleaf witchgrass	X																
Dichanthelium acuminatum	Panic grass	X						**X**	**X**			**X**						
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria serotina	Hairy crabgrass	X	X															
Drymaria cordata	West Indian chickweed		X															
Elephantopus elatus	Tall elephantsfoot		X					**X**	**X**							**X**		
Emilia sonchifolia	Tasselflower	X																
Erechtites hieraciifolius	Fireweed	X	X															
Eupatorium capillifolium	Dogfennel		X										**X**					
Eustachys glauca	Saltmarsh fingergrass	X											**X**					**X**
Galactia elliotii	Milkpea		X															
Gamochaeta antillana	Caribbean purple everlasting																	
Gelsemium sempervirens	Yellow jessamine		X				**X**		**X**	**X**	**X**	**X**			**X**	**X**	**X**	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum hypericoides	St. Andrews cross	X	X															
Hypericum mutilum	Dwarf St. John's-wort																	
Hypericum tetrapetalum	St. John's wort																	
Hyptis verticillata	John Charles																	
Ilex cassine	Dahoon holly																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X																
Juncus effusus	Softrush	X																

x = occurence within quadrat

TABLE 45: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add	T112-QN	T112-QS	T112-QE	T112-QW	T112-Add	T113-QN	T113-QS	T113-QE	T113-QW	T113-Add
Juncus marginatus	Grassleaf rush	X																
Juncus megacephalus	Bighead rush																	
Lachnocaulon anceps	White-head bogbutton	X																X
Liquidambar styraciflua	Sweetgum		X	X		X								X				
Ludwigia maritima	Seaside primrosewillow																	
Ludwigia peruviana	Primrose willow	X																
Lygodium microphyllum	Small-leaf climbing fern	X																
Magnolia virginiana	Sweetbay																	
Melochia corchorifolia	Chocolate-weed	X																
Mikania scandens	Climbing hempvine																	
Nephrolepis exaltata	Boston fern																	
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel		X															
Panicum hemitomon	Maidencane		X															
Panicum maximum	Guineagrass	X																
Parthenocissus quinquefolia	Virginia creeper		X				X											
Paspalum conjugatum	Sour paspalum	X	X														X	
Paspalum notatum	Bahia grass	X														X	X	
Paspalum setaceum	Thin paspalum		X															
Persea borbonia	Red bay		X															
Phytolacca americana	Common pokeweed																	
Pinus elliottii	Slash pine		X								X							X
Pinus palustris	Longleaf pine																	
Plantago virginica	Southern plantain		X															
Pluchea foetida	Stinking camphor weed																	
Pluchea rosea	Rosy camphorweed																	
Polygonum punctatum	Dotted smartweed	X																
Pouzolzia zeylanica	Pouzolz's bush	X																
Pteridium aquilinum	Bracken fern	X	X															
Pterocaulon pycnostachyum	Blackroot	X						X					X					X
Ptilimnium capillaceum	Bishop-weed		X															
Quercus laurifolia	Laurel oak		X														X	
Quercus nigra	Water oak		X										X					
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty																	
Rhynchospora fascicularis	Fasciculate beakrush	X							X	X								
Rhynchospora microcarpa	Southern beakrush	X																
Rubus argutus	Sawtooth blackberry		X															
Rubus sp.	Blackberry																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass																	
Schinus terebinthifolius	Brazilian pepper																	
Scleria baldwinii	Baldwin's nutrush	X																
Scleria ciliata var. ciliata	Fringed nutrush																	
Scoparia dulcis	Licorice weed	X	X															

x = occurence within quadrat

TABLE 45: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T111-QN	T111-QS	T111-QE	T111-QW	T111-Add	T112-QN	T112-QS	T112-QE	T112-QW	T112-Add	T113-QN	T113-QS	T113-QE	T113-QW	T113-Add
Serenoa repens	Saw palmetto		X															
Smilax auriculata	Earleaf greenbriar		X					X	X									
Smilax bona-nox	Saw greenbrier		X	X	X	X	X				X	X		X	X	X	X	
Solidago fistulosa	Pine-barren goldenrod	X	X						X									
Syngonanthus flavidulus	Bantam-buttons																	
Tillandsia fasciculata	Cardinal airplant		X															
Toxicodendron radicans	Poison ivy		X	X				X										
Typha sp.	Cattail	X																
Urena lobata	Caesarweed	X						X									X	
Vaccinium corymbosum	Highbush blueberry		X															
Viburnum obovatum	Walter's viburnum		X															
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape		X	X	X	X								X			X	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern			X							X							
Zingiber zerumbet	Bitter ginger																	
Totals		**40**	**48***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 46: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T107-QN	T107-QS	T107-QE	T107-QW	T107-Add	T108-QN	T108-QS	T108-QE	T108-QW	T108-Add	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add
Aeschynomene americana	Meadow joint-vetch						X											
Ambrosia artemisiifolia	Common ragweed		X															
Amphicarpum muehlenbergianum	Blue maidencane																	
Andropogon glomeratus	Bushy bluestem	X								X								
Andropogon virginicus	Broomsedge	X	X		X		X						X					
Acer rubrum	Red maple		X										X					
Axonopus fissifolius	Southern carpet grass																	
Axonopus furcatus	Flat-joint carpet grass																	
Baccharis halimifolia	Eastern false-willow		X										X					
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle																	
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X															
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower		X															
Conyza canadensis	Dwarf horseweed	X											X					
Croton michauxii	Rushfoil																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge	X																
Desmodium paniculatum	Panicled Ticktrefoil	X	X										X					
Dichanthelium aciculare	Needleleaf witchgrass																	
Dichanthelium acuminatum	Panic grass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed		X															
Diospyros virginiana	Persimmon		X															
Eleocharis baldwinii	Baldwin's spikerush	X																
Emilia fosbergii	Florida tasselflower																	
Erechtites hieraciifolius	Fireweed		X															
Eriocaulon decangulare	Ten-angle pipewort	X			X													
Eupatorium capillifolium	Dogfennel		X		X													X
Eupatorium rotundifolium	False hoarhound																	
Eustachys glauca	Saltmarsh fingergrass																	
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw		X										X					
Gelsemium sempervirens	Yellow jessamine		X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X					X											
Hypericum hypericoides	St. Andrews cross		X															
Hypericum mutilum	Dwarf St. John's-wort																	
Hypericum tetrapetalum	St. John's wort																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass								X	X	X	X						
Indigofera hirsuta	Hairy indigo																	
Iris hexagona	Iris																	

x = occurence within quadrat

TABLE 46: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T107-QN	T107-QS	T107-QE	T107-QW	T107-Add	T108-QN	T108-QS	T108-QE	T108-QW	T108-Add	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X						X					X					
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnocaulon anceps	White-head bogbutton																	
Lachnanthes caroliniana	Carolina redroot							X										
Ludwigia maritima	Seaside primrosewillow																	
Ludwigia peruviana	Primrose willow																	
Lycopodiella cernua	Nodding clubmoss							X										
Lygodium microphyllum	Small-leaf climbing fern																	
Lyonia lucida	Fetterbush							X										
Lythrum alatum	Winged lythrum	X																
Myrica cerifera	Wax myrtle		X															
Melochia corchorifolia	Chocolate-weed																	
Magnolia virginiana	Sweetbay																	
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel		X															
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X															X
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Parthenocissus quinquefolia	Virginia creeper		X															
Paspalum conjugatum	Sour paspalum		X															
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum		X															
Phytolacca americana	Common pokeweed																	
Phyllanthus urinaria	Chamberbitter												X					
Pinus elliottii	Slash pine		X															
Pluchea rosea	Rosy camphorweed																	
Polygonum punctatum	Dotted smartweed																	
Persea palustris	Swamp bay																	
Praxelis clematidea	Praxelis																	
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken																	X
Pterocaulon pycnostachyum	Blackroot																	
Quercus laurifolia	Laurel oak		X															
Quercus nigra	Water oak		X					X										
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X						X										
Rhus copallinum	Winged sumac							X										
Rhynchospora fascicularis	Fasciculate beakrush	X						X										X
Rhynchospora microcarpa	Southern beakrush																	
Rubus argutus	Sawtooth blackberry		X								X							
Rubus sp.	Blackberry																	
Sacciolepis indica	Glenwood grass																	
Scoparia dulcis	Licorice weed		X															
Serenoa repens	Saw palmetto	X	X			X	X						X		X			
Setaria parviflora	Knotroot bristle grass																	

x = occurence within quadrat

TABLE 46: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T107-QN	T107-QS	T107-QE	T107-QW	T107-Add	T108-QN	T108-QS	T108-QE	T108-QW	T108-Add	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add
Smilax auriculata	Earleaf greenbriar		X			**X**												**X**
Smilax bona-nox	Saw greenbrier		X	**X**														
Solidago fistulosa	Pine-barren goldenrod	X	X															**X**
Solanum viarum	Tropical soda apple																	
Sabal palmetto	Cabbage palm		X															
Sporobolus indicus	Smutgrass																	
Schinus terebinthifolius	Brazilian pepper																	
Tillandsia fasciculata	Cardinal airplant		X															
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy		X															
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X						**X**			**X**							**X**
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea	X											**X**					
Vitis rotundifolia	Muscadine grape		X	**X**														
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern				**X**		**X**											
Xyris sp.	Yellow-eyed grass	X			**X**													
Zingiber zerumbet	Bitter ginger																	
Totals		**22**	**46***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 46: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add
Aeschynomene americana	Meadow joint-vetch							
Ambrosia artemisiifolia	Common ragweed		X					
Amphicarpum muehlenbergianum	Blue maidencane							
Andropogon glomeratus	Bushy bluestem	X						
Andropogon virginicus	Broomsedge	X	X					
Acer rubrum	Red maple		X					
Axonopus fissifolius	Southern carpet grass							
Axonopus furcatus	Flat-joint carpet grass							
Baccharis halimifolia	Eastern false-willow		X					
Bidens alba (synonym B. pilosa)	White beggar-ticks		X					
Boehmeria cylindrica	Small-spike false nettle							
Bulbostylis barbata	Watergrass							
Callicarpa americana	American beauty-berry		X					X
Carex longii	Long's sedge	X	X					
Centella asiatica	Asian coinwort		X					
Cirsium nuttallii	Nuttall's thistle							
Commelina diffusa	Dayflower		X					
Conyza canadensis	Dwarf horseweed	X						
Croton michauxii	Rushfoil							
Cynodon dactylon	Bermuda grass							
Cyperus croceus	Baldwin flatsedge		X					
Cyperus retrorsus	Pinebarren flatsedge	X	X					
Cyperus strigosus	Straw colored flatsedge	X						
Desmodium paniculatum	Panicled Ticktrefoil	X	X					
Dichanthelium aciculare	Needleleaf witchgrass							
Dichanthelium acuminatum	Panic grass							
Digitaria ciliaris	Southern crabgrass		X					
Digitaria serotina	Hairy crabgrass		X					
Drymaria cordata	West Indian chickweed		X					
Diospyros virginiana	Persimmon		X					
Eleocharis baldwinii	Baldwin's spikerush	X						
Emilia fosbergii	Florida tasselflower							
Erechtites hieraciifolius	Fireweed		X					
Eriocaulon decangulare	Ten-angle pipewort	X						
Eupatorium capillifolium	Dogfennel		X					
Eupatorium rotundifolium	False hoarhound							
Eustachys glauca	Saltmarsh fingergrass							
Galactia elliotii	Milkpea		X		**X**			
Galium tinctorium	Bedstraw		X					
Gelsemium sempervirens	Yellow jessamine		X					
Hydrocotyle umbellata	Manyflower marshpennywort		X					
Hypericum cistifolium	Round-pod St. John's wort	X						
Hypericum hypericoides	St. Andrews cross		X					
Hypericum mutilum	Dwarf St. John's-wort							
Hypericum tetrapetalum	St. John's wort							
Hyptis verticillata	John Charles							
Imperata cylindrica	Cogon grass							
Indigofera hirsuta	Hairy indigo							
Iris hexagona	Iris							

x = occurence within quadrat

TABLE 46: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add
Juncus effusus	Softrush							
Juncus marginatus	Grassleaf rush	X						
Juncus megacephalus	Bighead rush							
Juncus scirpoides	Needlepod rush							
Kyllinga brevifolia	Shortleaf spikesedge							
Lachnocaulon anceps	White-head bogbutton							
Lachnanthes caroliniana	Carolina redroot							
Ludwigia maritima	Seaside primrosewillow							
Ludwigia peruviana	Primrose willow							
Lycopodiella cernua	Nodding clubmoss							
Lygodium microphyllum	Small-leaf climbing fern							
Lyonia lucida	Fetterbush							
Lythrum alatum	Winged lythrum	X						
Myrica cerifera	Wax myrtle		X					
Melochia corchorifolia	Chocolate-weed							
Magnolia virginiana	Sweetbay							
Osmunda cinnamomea	Cinnamon fern							
Oxalis corniculata	Yellow wood sorrel		X					
Panicum anceps	Beaked panic grass		X					
Panicum hemitomon	Maidencane		X					
Panicum repens	Torpedo grass	X						
Panicum rigidulum	Red-top panic grass	X						
Parthenocissus quinquefolia	Virginia creeper		X					
Paspalum conjugatum	Sour paspalum		X					
Paspalum notatum	Bahia grass	X		**X**	**X**	**X**		
Paspalum setaceum	Thin paspalum		X					
Phytolacca americana	Common pokeweed							
Phyllanthus urinaria	Chamberbitter							
Pinus elliottii	Slash pine		X					
Pluchea rosea	Rosy camphorweed							
Polygonum punctatum	Dotted smartweed							
Persea palustris	Swamp bay							
Praxelis clematidea	Praxelis							
Pteridium aquilinum	Bracken fern		X					
Pteridium aquilinum var. pseudocaudatum	Tailed bracken							
Pterocaulon pycnostachyum	Blackroot							**X**
Quercus laurifolia	Laurel oak		X	**X**				
Quercus nigra	Water oak		X					
Quercus virginiana	Live oak		X					
Rhexia mariana	Meadow-beauty	X						
Rhus copallinum	Winged sumac							
Rhynchospora fascicularis	Fasciculate beakrush	X						
Rhynchospora microcarpa	Southern beakrush							
Rubus argutus	Sawtooth blackberry		X					
Rubus sp.	Blackberry							
Sacciolepis indica	Glenwood grass							
Scoparia dulcis	Licorice weed		X					
Serenoa repens	Saw palmetto	X	X				**X**	
Setaria parviflora	Knotroot bristle grass							

x = occurence within quadrat

TABLE 46: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add
Smilax auriculata	Earleaf greenbriar		X					
Smilax bona-nox	Saw greenbrier		X	**X**	**X**	**X**		
Solidago fistulosa	Pine-barren goldenrod	X	X					**X**
Solanum viarum	Tropical soda apple							
Sabal palmetto	Cabbage palm		X					
Sporobolus indicus	Smutgrass							
Schinus terebinthifolius	Brazilian pepper							
Tillandsia fasciculata	Cardinal airplant		X					
Tillandsia usneoides	Spanish moss		X					
Toxicodendron radicans	Poison ivy		X					
Typha sp.	Cattail							
Urena lobata	Caesarweed	X				**X**		
Vicia acutifolia	Four-leaf vetch							
Vigna luteola	Hairypod cowpea	X						
Vitis rotundifolia	Muscadine grape		X					**X**
Woodwardia areolata	Netted chain fern							
Woodwardia virginica	Virginia chain fern							
Xyris sp.	Yellow-eyed grass	X						
Zingiber zerumbet	Bitter ginger							
Totals		**22**	**46***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 47: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFICNAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T103-QN	T103-QS	T103-QE	T103-QW	T103-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Abutilon theophrasti	Velvetleaf																	
Aeschynomene americana	Meadow joint-vetch																	
Andropogon virginicus	Broomsedge	X	X	X	X	X	X		X	X	X	X				X	X	
Aristida stricta	Wiregrass		X	X	X	X	X					X						
Asimina obovata	Bigflower pawpaw		X					X										
Axonopus furcatus	Flat-joint carpet grass																	
Baccharis halimifolia	Eastern false-willow																	
Buchnera americana	American bluehearts	X	X					X					X					
Bulbostylis barbata	Watergrass	X										X			X			
Chapmannia floridana	Florida alicia		X															
Chrysopsis subulata	Scrubland goldenaster	X	X					X				X						
Commelina erecta	Sandhill dayflower	X	X					X					X					
Conyza canadensis	Dwarf horseweed																	
Coreopsis leavenworthii	Leavenworth's tickseed	X																
Crotalaria pallida	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells		X															
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X	X	X	X						X						
Cyperus croceus	Baldwin flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X	X									X					
Cyperus surinamensis	Tropical flatsedge																	
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X		X						X								
Digitaria serotina	Hairy crabgrass																	
Diodia teres	Poor joe																	
Elephantopus elatus	Tall elephantsfoot		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Eustachys glauca	Saltmarsh fingergrass																	

x = occurrence within quadrat

TABLE 47: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFICNAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T103-QN	T103-QS	T103-QE	T103-QW	T103-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Euthamia caroliniana	Slender goldenrod			X	X	X	X		X	X	X	X						
Galactia elliotii	Milkpea		X					X										
Gamochaeta pensylvanica	Pennsylvania everlasting												X					
Helianthemum corymbosum	Pinebarren frostweed	X											X					
Heterotheca subaxillaris	Camphorweed		X															
Hypericum cistifolium	Round-pod St. John's wort																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo																	
Juncus marginatus	Grassleaf rush																	
Juncus scirpoides	Needlepod rush	X		X					X									
Lachnocaulon anceps	White-head bogbutton	X			X	X			X									
Lechea cernua	Nodding pinweed		X															
Lechea torreyi	Piedmont pinweed		X					X		X		X						
Licania michauxii	Gopher apple		X	X														
Lindernia crustacea	Malaysian false pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X																
Melinis repens	Natalgrass	X												X			X	
Melochia corchorifolia	Chocolate-weed																	
Opuntia humifusa	Pricklypear		X				X			X	X							
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum		X			X			X	X		X						
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal	X	X			X							X					
Pityopsis graminifolia	Narrowleaf silkgrass	X	X		X								X					
Polypremum procumbens	Rustweed	X						X										
Polypremum procumbens	Rustweed																	
Praxelis clematidea	Praxelis																	
Pteridium aquilinum	Bracken fern																	
Pterocaulon pycnostachyum	Blackroot	X				X				X								
Quercus geminata	Sand live oak		X						X		X					X		
Quercus pumila	Running oak																	
Rhus copallinum	Winged sumac		X					X	X	X								
Rubus sp.	Blackberry																	
Rumex hastatulus	Dock																	
Scoparia dulcis	Licorice weed	X																
Serenoa repens	Saw palmetto	X	X					X										
Setaria parviflora	Knotroot bristle grass																	
Sida rhombifolia	Indian hemp																	
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier									X	X							
Sporobolus indicus	Smutgrass																	
Stillingia sylvatica	Queensdelight		X					X					X					
Stipulicida setacea var. lacerata	Pineland scalypink		X															
Urena lobata	Caesarweed																	
Vaccinium corymbosum	Highbush blueberry													X				
Vaccinium myrsinites	Shiny blueberry		X			X	X						X					
	Totals	**20**	**31***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within quadrat

TABLE 47: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFICNAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T106-QN	T106-QS	T106-QE	T106-QW	T106-Add
Abutilon theophrasti	Velvetleaf							
Aeschynomene americana	Meadow joint-vetch							
Andropogon virginicus	Broomsedge	X	X	**X**	**X**			
Aristida stricta	Wiregrass		X			**X**		
Asimina obovata	Bigflower pawpaw		X					
Axonopus furcatus	Flat-joint carpet grass							
Baccharis halimifolia	Eastern false-willow							
Buchnera americana	American bluehearts	X	X	**X**				
Bulbostylis barbata	Watergrass	X						
Chapmannia floridana	Florida alicia		X					
Chrysopsis subulata	Scrubland goldenaster	X	X	**X**		**X**	**X**	
Commelina erecta	Sandhill dayflower	X	X	**X**				
Conyza canadensis	Dwarf horseweed							
Coreopsis leavenworthii	Leavenworth's tickseed	X						
Crotalaria pallida	Smooth rattle-box							
Crotalaria rotundifolia	Rabbitbells		X					
Crotalaria spectabilis	Rattle-box							
Croton michauxii	Rushfoil	X	X	**X**	**X**		**X**	
Cyperus croceus	Baldwin flatsedge		X					
Cyperus retrorsus	Pinebarren flatsedge	X	X			**X**	**X**	
Cyperus surinamensis	Tropical flatsedge							
Desmodium triflorum	Beggarweed							
Dichanthelium aciculare	Needleleaf witchgrass		X					
Dichanthelium acuminatum	Panic grass	X						
Digitaria serotina	Hairy crabgrass							
Diodia teres	Poor joe							
Elephantopus elatus	Tall elephantsfoot		X					
Eupatorium capillifolium	Dogfennel		X					**X**
Eupatorium mohrii	Eupatorium		X					
Eustachys glauca	Saltmarsh fingergrass							

x = occurrence within quadrat

TABLE 47: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFICNAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T106-QN	T106-QS	T106-QE	T106-QW	T106-Add
Euthamia caroliniana	Slender goldenrod			**X**	**X**			
Galactia elliotii	Milkpea		X	**X**		**X**		
Gamochaeta pensylvanica	Pennsylvania everlasting							
Helianthemum corymbosum	Pinebarren frostweed	X						
Heterotheca subaxillaris	Camphorweed		X					
Hypericum cistifolium	Round-pod St. John's wort							
Imperata cylindrica	Cogon grass							
Indigofera hirsuta	Hairy indigo							
Juncus marginatus	Grassleaf rush							
Juncus scirpoides	Needlepod rush	X			**X**			
Lachnocaulon anceps	White-head bogbutton	X						**X**
Lechea cernua	Nodding pinweed		X					
Lechea torreyi	Piedmont pinweed		X					**X**
Licania michauxii	Gopher apple		X		**X**			
Lindernia crustacea	Malaysian false pimpernel							
Ludwigia maritima	Seaside primrosewillow	X						**X**
Melinis repens	Natalgrass	X						
Melochia corchorifolia	Chocolate-weed							
Opuntia humifusa	Pricklypear		X			**X**		
Paspalum notatum	Bahia grass							
Paspalum setaceum	Thin paspalum		X	**X**	**X**	**X**	**X**	
Phytolacca americana	Common pokeweed							
Piloblephis rigida	Wild pennyroyal	X	X					**X**
Pityopsis graminifolia	Narrowleaf silkgrass	X	X					
Polypremum procumbens	Rustweed	X					**X**	
Polypremum procumbens	Rustweed							
Praxelis clematidea	Praxelis							
Pteridium aquilinum	Bracken fern							
Pterocaulon pycnostachyum	Blackroot	X		**X**	**X**			
Quercus geminata	Sand live oak		X				**X**	
Quercus pumila	Running oak							**X**
Rhus copallinum	Winged sumac		X					
Rubus sp.	Blackberry							
Rumex hastatulus	Dock							
Scoparia dulcis	Licorice weed	X						
Serenoa repens	Saw palmetto	X	X					**X**
Setaria parviflora	Knotroot bristle grass							
Sida rhombifolia	Indian hemp							
Smilax auriculata	Earleaf greenbriar		X					
Smilax bona-nox	Saw greenbrier							
Sporobolus indicus	Smutgrass							
Stillingia sylvatica	Queensdelight		X		**X**			
Stipulicida setacea var. lacerata	Pineland scalypink		X					
Urena lobata	Caesarweed							
Vaccinium corymbosum	Highbush blueberry							
Vaccinium myrsinites	Shiny blueberry		X					
	Totals	**20**	**31***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within quadrat

TABLE 48: HERBACEOUS INVENTORY MATRIX - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T100-QN	T100-QS	T100-QE	T100-QW	T100-Add	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T102-QN	T102-QS	T102-QE	T102-QW	T102-Add
Acer rubrum	Red maple																	
Andropogon virginicus	Broomsedge	X	X			X	X		X			X						X
Aristida stricta	Wiregrass		X												X			
Aristida stricta var. beyrichiana	Pineland three-awn																	
Asclepias feayi	Florida milkweed	X																
Asimina obovata	Bigflower pawpaw		X				X						X					
Asimina reticulata	Netted pawpaw		X															
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callisia ornata	Florida scrub roseling	X	X															
Carphephorus corymbosus	Florida paintbrush	X	X															
Chapmannia floridana	Florida alicia	X	X															
Chrysopsis subulata	Scrubland goldenaster		X			X												
Cladonia sp.	Deer moss																	
Cnidoscolus stimulosus	Tread-softly	X	X															
Commelina erecta	Sandhill dayflower		X															
Croton argyranthemus	Silver croton																	
Cyperus retrorsus	Pinebarren flatsedge	X	X		X	X	X			X								
Dichanthelium aciculare	Needleleaf witchgrass	X	X															
Dichanthelium acuminatum	Panic grass				X	X	X		X	X		X						
Elephantopus elatus	Tall elephantsfoot		X															
Erigeron quercifolius	Oak-leaf fleabane	X																X
Eulophia alata	Wild coco																	
Eupatorium capillifolium	Dogfennel		X															
Euthamia caroliniana	Slender goldenrod					X												X
Galactia elliotii	Milkpea		X															
Gratiola hispida	Rough hedgehyssop	X	X					X					X					
Helianthemum corymbosum	Pinebarren frostweed																	
Heterotheca subaxillaris	Camphorweed	X	X															
Hypericum hypericoides	St. Andrews cross																	
Hypericum mutilum	Dwarf St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X					X						X					X
Imperata cylindrica	Cogon grass																	
Indigofera caroliniana	Carolina indigo		X															
Indigofera hirsuta	Hairy indigo																	
Juncus marginatus	Grassleaf rush	X																
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush	X		X			X							X		X		
Lachnocaulon anceps	White-head bogbutton																	
Lechea torreyi	Piedmont pinweed	X	X			X				X								
Ludwigia maritima	Seaside primrosewillow																	
Lygodesmia aphylla	Roserush	X																
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Nephrolepis exaltata	Boston fern																	
Opuntia humifusa	Pricklypear		X		X					X	X				X			

x = occurence within quadrat

TABLE 48: HERBACEOUS INVENTORY MATRIX - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T100-QN	T100-QS	T100-QE	T100-QW	T100-Add	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T102-QN	T102-QS	T102-QE	T102-QW	T102-Add
Panicum rigidulum	Red-top panic grass	X																
Parthenocissus quinquefolia	Virginia creeper																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum		X	**X**									**X**					
Piloblephis rigida	Wild pennyroyal	X	X	**X**							**X**							
Pinus elliottii	Slash pine																	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X												**X**	**X**	**X**	
Polypremum procumbens	Rustweed	X																
Pteridium aquilinum	Bracken fern	X																
Pterocaulon pycnostachyum	Blackroot	X				**X**							**X**					**X**
Quercus geminata	Sand live oak		X															
Quercus pumila	Running oak																	
Quercus virginiana	Live oak							**X**	**X**		**X**							
Rhexia mariana	Meadow-beauty																	
Rhus copallinum	Winged sumac		X															
Scleria ciliata var. ciliata	Fringed nutrush	X	X															
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto	X	X					**X**					**X**			**X**		
Smilax auriculata	Earleaf greenbriar		X															**X**
Smilax bona-nox	Saw greenbrier												**X**					
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Sporobolus indicus	Smutgrass	X																
Stillingia sylvatica	Queensdelight		X															
Stipulicida setacea var. lacerata	Pineland scalypink		X															
Syngonanthus flavidulus	Bantam-buttons	X												**X**				
Urena lobata	Caesarweed	X																
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X														**X**	
Vitis rotundifolia	Muscadine grape		X															
Xyris sp.	Yellow-eyed grass	X												**X**				
Yucca filamentosa	Adam's needle		X		**X**								**X**					
	Totals	**29**	**37***															

***** Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 49: HERBACEOUS INVENTORY MATRIX - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T97-QN	T97-QS	T97-QE	T97-QW	T97-Add	T98-QN	T98-QS	T98-QE	T98-QW	T98-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Andropogon virginicus	Broomsedge	X	X					X	X									X
Aristida spiciformis	Pinebarren three-awn	X				X	X		X		X	X						
Aristida stricta	Wiregrass	X	X	X						X				X	X	X	X	
Bejaria racemosa	Tarflower	X	X					X					X		X			
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X			X				X		X							
Callicarpa americana	American beauty-berry		X															
Carphephorus corymbosus	Florida paintbrush	X	X															
Chapmannia floridana	Florida alicia		X															
Chrysopsis subulata	Scrubland goldenaster		X	X	X	X	X						X					
Dichanthelium aciculare	Needleleaf witchgrass	X	X															
Dichanthelium acuminatum	Panic grass																	
Diodia virginiana	Rough button-weed																	
Emilia fosbergii	Florida tasselflower																	
Euthamia caroliniana	Slender goldenrod				X		X				X							
Galactia elliotii	Milkpea		X						X	X		X						
Gratiola hispida	Rough hedgehyssop	X	X			X												
Helianthemum corymbosum	Pinebarren frostweed																	
Hypericum tetrapetalum	St. John's wort	X																
Ilex glabra	Gallberry		X										X				X	
Imperata cylindrica	Cogon grass																	
Indigofera caroliniana	Carolina indigo		X		X		X		X							X		
Indigofera hirsuta	Hairy indigo																	
Indigofera suffruticosa	Anil de pasto																	
Lechea torreyi	Piedmont pinweed		X					X		X				X				
Licania michauxii	Gopher apple		X							X	X							
Opuntia humifusa	Pricklypear		X															
Paspalum setaceum	Thin paspalum		X															
Persea borbonia	Red bay																	
Piloblephis rigida	Wild pennyroyal		X															
Polypremum procumbens	Rustweed																	
Pteridium aquilinum	Bracken fern																	
Pterocaulon pycnostachyum	Blackroot			X		X							X					X
Quercus chapmanii	Chapman's oak		X															
Quercus geminata	Sand live oak		X							X	X	X						
Quercus laevis	Turkey oak		X								X							
Quercus minima	Dwarf live oak		X															
Quercus myrtifolia	Myrtle oak		X															
Quercus pumila	Running oak							X					X				X	
Quercus virginiana	Live oak																	

x = occurence within quadrat

TABLE 49: HERBACEOUS INVENTORY MATRIX - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) MONITORING EVENT - JUNE 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T97-QN	T97-QS	T97-QE	T97-QW	T97-Add	T98-QN	T98-QS	T98-QE	T98-QW	T98-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Rhus copallinum	Winged sumac		X		**X**								**X**					
Rhynchospora fascicularis	Fasciculate beakrush	X						**X**								**X**		
Serenoa repens	Saw palmetto	X	X	**X**	**X**	**X**	**X**						**X**		**X**	**X**		
Smilax bona-nox	Saw greenbrier																	
Smilax laurifolia	Laurel greenbrier																	
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Stipulicida setacea var. lacerata	Pineland scalypink	X	X															
Urena lobata	Caesarweed																	
Vaccinium corymbosum	Highbush blueberry																	**X**
Vaccinium myrsinites	Shiny blueberry		X					**X**					**X**		**X**	**X**		
Vitis rotundifolia	Muscadine grape		X															
Yucca filamentosa	Adam's needle		X															
Totals		**13**	**30**															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 50: WILDLIFE UTILIZATION - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Accipiter cooperii	Cooper's hawk	Falconiformes	-	-	
Agelaius phoeniceus	Red-winged blackbird	Passeriformes	-	-	
Anhinga anhinga	Anhinga	Pelecaniformes	-	-	
Antigone canadensis	Sandhill crane	Gruiformes		-	
Antigone canadensis pratensis	Florida sandhill crane	Gruiformes	-[5]	-	**
Ardea alba	Great egret	Ciconiiformes	-	-	
Ardea herodias	Great blue heron	Ciconiiformes	-	-	
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	**
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Charadrius vociferous	Killdeer	Charadriiformes	-	-	
Chordeiles minor	Common nighthawk	Caprimulgiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	**
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	**
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Egretta caerulea	Little blue heron	Ciconiiformes	ST	-	
Egretta thula	Snowy egret	Ciconiiformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	**
Eudocimus albus	White ibis	Ciconiiformes	-	-	
Falco sparverius	American kestrel	Falconiformes	-[6]	-	
Falco sparverius paulus	Southeastern American kestrel	Falconiformes	ST	-	*
Gallinago gallinago	Common snipe	Charadriiformes	-	-	
Gallinula chloropus	Common moorhen	Gruiformes	-	-	
Geothlypis trichas	Common yellowthroat	Passeriformes	-	-	
Haliaeetus leucocephalus	Bald eagle	Falconiformes	-[7]	-[7]	
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	
Leucophaeus atricilla	Laughing gull	Charadriiformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Melospiza georgiana	Swamp sparrow	Passeriformes	-	-	
Melospiza melodia	Song sparrow	Passeriformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Pelecanus erythrorhynchos	American white pelican	Pelecaniformes	-	-	

TABLE 50: WILDLIFE UTILIZATION - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN (continued)					
Avian Species Listed in Manual[4](continued)					
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Plegadis falcinellus	Glossy ibis	Ciconiiformes	-	-	**
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus major	Boat-tailed grackle	Passeriformes	-	-	**
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Spatula discors	Blue-winged teal	Anseriformes	-	-	
Strix varia	Barred owl	Strigiformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Tringa melanoleuca	Greater yellowlegs	Charadriiformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	**
Porphyrio martinica	Purple gallinule	Gruiformes	-	-	
Gallinula galeata	Common gallinule	Gruiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Agkistrodon piscivorus conanti	Florida water moccasin	Squamata	-	-	
Anolis carolinensis	Green anole	Squamata	-	-	**
Aspidoscelis sexlineata	Six-lined racerunner	Squamata	-	-	*
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Crotalus adamanteus	Eastern diamondback rattlesnake	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Pseudemys floridana	Florida cooter	Testudines	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla cinerea	Green treefrog	Anura	-	-	
Lithobates grylio	Pig frog	Anura	-	-	
Lithobates sphenocephala	Southern leopard frog	Anura	-	-	

TABLE 50: WILDLIFE UTILIZATION - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[4]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Felis rufus	Bobcat	Carnivora	-	-	
Mephitis mephitis	Striped skunk	Carnivora	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the sandhill crane could not be determined. The listed (State Threatened) subspecies (*Anitgone canadensis pratensis*) is a Florida resident year-round, whereas the unlisted subspecies (*Anitgone canadensis tabida*) is migratory and occurs in Florida from approximately October until March.

[6]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

[7]The bald eagle has been delisted from the FWC's list of threatened species and the FWS's Endangered Species Act; however this species is remains protected by F.A.C. 68A-16.002, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

TABLE 51: WILDLIFE UTILIZATION - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Accipiter cooperii	Cooper's hawk	Falconiformes	-	-	
Antigone canadensis pratensis	Florida sandhill crane	Gruiformes	-[5]	-	
Ardea alba	Great egret	Ciconiiformes	-	-	
Ardea herodias	Great blue heron	Ciconiiformes	-	-	
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Colinus virginianus	Northern bobwhite	Galliformes	-	-	**
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	**
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	

TABLE 51: WILDLIFE UTILIZATION - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Lithobates grylio	Pig frog	Anura	-	-	
Lithobates sphenocephala	Southern leopard frog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Mephitis mephitis	Striped skunk	Carnivora	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the sandhill crane could not be determined. The listed (State Threatened) subspecies (*Anitgone canadensis pratensis*) is a Florida resident year-round, whereas the unlisted subspecies (*Anitgone canadensis tabida*) is migratory and occurs in Florida from approximately October until March.

TABLE 52: WILDLIFE UTILIZATION - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Chordeiles minor	Common nighthawk	Caprimulgiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	**
Columbina passerina	Common ground dove	Columbiformes	-	-	**
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	**
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Crotalus adamanteus	Eastern diamondback rattlesnake	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[4]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 53: WILDLIFE UTILIZATION - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Accipiter cooperii	Cooper's hawk	Falconiformes	-	-	
Antigone canadensis pratensis	Florida sandhill crane	Gruiformes	-[5]	-	*
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Cyanocitta cristata	Blue jay	Passeriformes	-	-	
Dryobates pubescens	Downy woodpecker	Piciformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	
Eudocimus albus	White ibis	Ciconiiformes	-	-	
Falco sparverius	American kestrel	Falconiformes	-[6]	-	
Falco sparverius paulus	Southeastern American kestrel	Falconiformes	ST	-	*
Geothlypis trichas	Common yellowthroat	Passeriformes	-	-	
Haliaeetus leucocephalus	Bald eagle	Falconiformes	-[7]	-[7]	
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus major	Boat-tailed grackle	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Spatula discors	Blue-winged teal	Anseriformes	-	-	
Strix varia	Barred owl	Strigiformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	

TABLE 53: WILDLIFE UTILIZATION - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
REPTILE					
Reptile Species Listed in Manual[4]					
Aspidoscelis sexlineata	Six-lined racerunner	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Lithobates sphenocephala	Southern leopard frog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[4]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Felis rufus	Bobcat	Carnivora	-	-	
Mephitis mephitis	Striped skunk	Carnivora	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	**
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sciurus niger	Southern fox squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the sandhill crane could not be determined. The listed (State Threatened) subspecies (*Anitgone canadensis pratensis*) is a Florida resident year-round, whereas the unlisted subspecies (*Anitgone canadensis tabida*) is migratory and occurs in Florida from approximately October until March.

[6]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

[7]The bald eagle has been delisted from the FWC's list of threatened species and the FWS's Endangered Species Act; however this species is remains protected by F.A.C. 68A-16.002, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

TABLE 54: WILDLIFE UTILIZATION - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Charadrius vociferous	Killdeer	Charadriiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Setophaga americana	Northern parula	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla cinerea	Green treefrog	Anura	-	-	

TABLE 54: WILDLIFE UTILIZATION - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 55: WILDLIFE UTILIZATION - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Chaetura pelagica	Chimney swift	Apodiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Corvus ossifragus	Fish crow	Passeriformes	-	-	
Cyanocitta cristata	Blue jay	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Falco sparverius paulus	Southeastern American kestrel	Falconiformes	-[5]	-	*
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Myiarchus crinitus	Great crested flycatcher	Passeriformes	-	-	
Pandion haliaetus	Osprey	Falconiformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga americana	Northern parula	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	**
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	

TABLE 55: WILDLIFE UTILIZATION - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[6]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

TABLE 56: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Agelaius phoeniceus	Red-winged blackbird	Passeriformes	-	-	
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	**
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Geothlypis trichas	Common yellowthroat	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Quiscalus major	Boat-tailed grackle	Passeriformes	-	-	*
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
MAMMAL					
Mammal Species Listed in Manual[4]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 57: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	**
Dryobates pubescens	Downy woodpecker	Piciformes	-	-	**
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Geothlypis trichas	Common yellowthroat	Passeriformes	-	-	**
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga americana	Northern parula	Passeriformes	-	-	**
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
REPTILE					
Reptile Species Listed in Manual[(4)]					
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla squirrela	Squirrel treefrog	Anura	-	-	
Species *Not* Listed in Manual					
Eleutherodactylus planirostris	Greenhouse frog	Anura	-	-	

TABLE 57: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 58: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
REPTILE					
Reptile Species Listed in Manual[(4)]					
Agkistrodon piscivorus conanti	Florida water moccasin	Squamata	-	-	
Anolis carolinensis	Green anole	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla cinerea	Green treefrog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 59: WILDLIFE UTILIZATION -XERIC OAK (RECLAMATION)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	*
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sialia sialis	Eastern Bluebird	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Porphyrio martinica	Purple gallinule	Gruiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[4]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	*
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 60: WILDLIFE UTILIZATION - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Charadrius vociferous	Killdeer	Charadriiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Corvus ossifragus	Fish crow	Passeriformes	-	-	
Cyanocitta cristata	Blue jay	Passeriformes	-	-	
Dryobates pubescens	Downy woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	*
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Myiarchus crinitus	Great crested flycatcher	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Anolis carolinensis	Green anole	Squamata	-	-	
Aspidoscelis sexlineata	Six-lined racerunner	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla cinerea	Green treefrog	Anura	-	-	

TABLE 60: WILDLIFE UTILIZATION - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[4]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 61: WILDLIFE UTILIZATION - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	*
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	**
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Setophaga americana	Northern parula	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	

TABLE 61: WILDLIFE UTILIZATION - XERIC OAK (NATIVE AREA)
4TH ANNUAL (SPRING) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
JUNE 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 06/19/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 62: TREE DENSITY BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	28	0	28	20	40.6	1.8	0
Quercus virginiana	Live oak	UPL	8	1	9	6	13.0	0.8	0
Pinus elliottii	Slash pine	UPL	7	1	8	6	11.6	1.3	0
Sabal palmetto	Cabbage palm	FAC	1	0	1	1	1.5	<0.05	0
Tree Species Listed In Table Subtotals			**44**	**2**	**46**	**33**	**66.7**	**3.9**	**0**
Tree Species Not Listed in Table									
Acer rubrum	Red maple	FACW	10	0	10	7	14.5	0.4	0
Liquidambar styraciflua	Sweetgum	FACW	6	0	6	4	8.7	<0.05	0
Quercus nigra	Water oak	UPL	6	0	6	4	8.7	0.6	0
Quercus geminata	Sand live oak	UPL	1	0	1	1	1.5	<0.05	0
Tree Species Not Listed in Table Subtotals			**23**	**0**	**23**	**16**	**33.34**	**1.0**	**0**
TOTALS			**67**	**2**	**69**	**49**	**100.0**	**4.9**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	35	0	35	25
Baccharis halimifolia	Eastern false-willow	FAC	11	1	12	9
Hypericum tetrapetalum	St. John's wort	FAC	6	0	6	4
TOTALS			**52**	**1**	**53**	**38**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 63: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Dry Prairie (Reclamation)		
Species Listed in Tables[1]	33	28.4
Species Not Listed in Tables	25	19.8
Non-Native Species	17	15.5
Nuisance Species[2]	7	24.7
Total Species Cover	82	88.4
Total Bare Ground/Dead Litter	-	11.6
Dry Prairie (Enhancement)		
Species Listed in Tables[1]	7	10.4
Species Not Listed in Tables	9	30.3
Non-Native Species	3	4.7
Nuisance Species[2]	4	41.2
Total Species Cover	23	86.6
Total Bare Ground/Dead Litter	-	13.4
Dry Prairie (Native Area)		
Species Listed in Tables[1]	31	51.9
Species Not Listed in Tables	11	9.0
Non-Native Species	2	0.6
Nuisance Species[2]	3	6.8
Total Species Cover	47	68.3
Total Bare Ground/Dead Litter	-	32.2

TABLE 63: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Pine Flatwoods (Reclamation)		
Species Listed in Tables(1)	47	27.4
Species Not Listed in Tables	12	12.1
Non-Native Species	12	14.8
Nuisance Species(2)	6	13.9
Total Species Cover	77	68.2
Total Bare Ground/Dead Litter	-	32.4
Pine Flatwoods (Enhancement)		
Species Listed in Tables(1)	21	38.9
Species Not Listed in Tables	5	17.3
Non-Native Species	2	4.0
Nuisance Species(2)	2	20.3
Total Species Cover	30	80.5
Total Bare Ground/Dead Litter	-	19.6
Pine Flatwoods (Native Area)		
Species Listed in Tables(1)	17	48.7
Species Not Listed in Tables	6	14.7
Non-Native Species	1	0.3
Total Species Cover	24	63.7
Total Bare Ground/Dead Litter	-	36.4

TABLE 63: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Temperate Hardwoods (Reclamation)		
Species Listed in Tables[1]	7	18.6
Species Not Listed in Tables	11	25.4
Non-Native Species	7	16.8
Nuisance Species[2]	7	30.2
Total Species Cover	32	91.0
Total Bare Ground/Dead Litter	-	9.3
Temperate Hardwoods (Enhancement)		
Species Listed in Tables[1]	12	33.0
Species Not Listed in Tables	6	12.6
Non-Native Species	2	11.6
Nuisance Species[2]	2	8.0
Total Species Cover	22	65.2
Total Bare Ground/Dead Litter	-	34.8
Temperate Hardwoods (Native Area)		
Species Listed in Tables[1]	14	17.6
Species Not Listed in Tables	7	10.8
Non-Native Species	2	0.6
Nuisance Species[2]	4	15.7
Total Species Cover	27	44.7
Total Bare Ground/Dead Litter	-	55.4

TABLE 63: SUMMARY OF HERBACEOUS SPECIES COVER
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SPECIES CLASSIFICATION	NUMBER OF SPECIES	TOTAL PERCENT COVER
Xeric Oak (Reclamation)		
Species Listed in Tables(1)	9	19.4
Species Not Listed in Tables	9	18.7
Non-Native Species	5	6.6
Nuisance Species(2)	4	42.7
Total Species Cover	27	87.4
Total Bare Ground/Dead Litter	-	12.6
Xeric Oak (Enhancement)		
Species Listed in Tables(1)	10	16.6
Species Not Listed in Tables	4	13.3
Non-Native Species	1	1.0
Nuisance Species(2)	2	4.0
Total Species Cover	17	34.9
Total Bare Ground/Dead Litter	-	65.2
Xeric Oak (Native Area)		
Species Listed in Tables(1)	9	26.2
Species Not Listed in Tables	4	5.6
Nuisance Species(2)	1	0.4
Total Species Cover	14	32.2
Total Bare Ground/Dead Litter	-	67.8

(1) Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

(2) FISC (2023) Category 1 and 2 nuisance species.

TABLE 64: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables(1)				
Andropogon virginicus	Broomsedge	FAC	ǂ	5.6
Eragrostis elliottii	Elliot's lovegrass	FAC	ǂ	2.6
Eupatorium capillifolium	Dogfennel	FAC		2.5
Scoparia dulcis	Licorice weed	FAC	ǂ	2.5
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	2.3
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	1.4
Digitaria ciliaris	Southern crabgrass	UPL	ǂ	1.2
Hydrocotyle umbellata	Manyflower marshpennywort	FACW		1.1
Polygonum punctatum	Dotted smartweed	OBL	ǂ	1.1
Aristida stricta	Wiregrass	FAC		0.7
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.7
Panicum hemitomon	Maidencane	OBL	ǂ	0.7
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.6
Bidens alba (synonym B. pilosa)	White beggar-ticks	FAC	ǂ	0.5
Eragrostis spectabilis	Purple lovegrass	FAC		0.5
Gamochaeta pensylvanica	Pennsylvania everlasting	UPL		0.5
Helianthemum corymbosum	Pinebarren frostweed	UPL	ǂ	0.5
Solidago fistulosa	Pine-barren goldenrod	FACW		0.5
Chamaecrista nictitans	Wild sensitive plant	UPL	ǂ	0.4
Fimbristylis autumnalis	Fringe-rush	OBL		0.4
Paspalum setaceum	Thin paspalum	FAC	ǂ	0.4
Axonopus fissifolius	Southern carpet grass	FAC		0.3
Cyperus compressus	Poorland flatsedge	FACW	ǂ	0.2
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.2
Scleria ciliata var. ciliata	Fringed nutrush	FACW		0.2
Ambrosia artemisiifolia	Common ragweed	UPL	ǂ	0.1
Eustachys glauca	Saltmarsh fingergrass	FACW	ǂ	0.1
Galactia elliotii	Milkpea	UPL		0.1
Juncus marginatus	Grassleaf rush	FACW	ǂ	0.1
Opuntia humifusa	Pricklypear	UPL		0.1
Pityopsis graminifolia	Narrowleaf silkgrass	UPL		0.1
Rhexia mariana	Meadow-beauty	FACW	ǂ	0.1
Stillingia sylvatica	Queensdelight	FAC		0.1
Total Cover of Species Listed in Tables			**(20)**	**28.4**

TABLE 64: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Not Listed in Tables				
Aeschynomene americana	Meadow joint-vetch	UPL	ǂ	6.0
Schizachyrium stoloniferum	Creeping little bluestem	FAC		3.2
Polypremum procumbens	Rustweed	FAC	ǂ	2.3
Euthamia caroliniana	Slender goldenrod	FAC		1.8
Conyza canadensis	Dwarf horseweed	UPL	ǂ	1.1
Fimbristylis dichotoma	Forked fimbry	OBL	ǂ	0.7
Heterotheca subaxillaris	Camphorweed	UPL		0.7
Cyperus surinamensis	Tropical flatsedge	FACW	ǂ	0.4
Ludwigia octovalvis	Large seedbox	OBL	ǂ	0.4
Lythrum alatum	Winged lythrum	OBL	ǂ	0.4
Micranthemum umbrosum	Shade mudflower	OBL		0.4
Rubus argutus	Sawtooth blackberry	FAC		0.4
Chamaesyce hyssopifolia	Hyssopleaf sandmat	UPL	ǂ	0.3
Boehmeria cylindrica	Small-spike false nettle	OBL	ǂ	0.2
Commelina diffusa	Dayflower	FACW	ǂ	0.2
Dichanthelium acuminatum	Panic grass	FACW		0.2
Nephrolepis exaltata	Boston fern	FAC		0.2
Sesbania herbacea	Danglepod	FAC		0.2
Lechea deckertii	Deckert's pinweed	UPL		0.1
Mikania scandens	Climbing hempvine	-	ǂ	0.1
Panicum dichotomiflorum	Fall panicum	FACW	ǂ	0.1
Phytolacca americana	Common pokeweed	UPL	ǂ	0.1
Smilax bona-nox	Saw greenbrier	UPL		0.1
Symphyotrichum bahamense	Annual saltmarsh aster	OBL	ǂ	0.1
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.1
Total Cover of Species Not Listed in Tables			**(15)**	**19.8**

TABLE 64: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Non-Native Species				
Sporobolus indicus	Smutgrass	UPL	ǂ	5.8
Lindernia crustacea	Malaysian false pimpernel	FAC	ǂ	2.4
Indigofera hirsuta	Hairy indigo	UPL	ǂ	1.1
Phyllanthus urinaria	Chamberbitter	FAC	ǂ	1.1
Sacciolepis indica	Indian cupscale	FAC	ǂ	1.0
Commelina gambiae	Gambian dayflower	FACW	ǂ	0.9
Crotalaria pallida	Smooth rattle-box	UPL	ǂ	0.8
Bulbostylis barbata	Watergrass	UPL	ǂ	0.6
Crotalaria spectabilis	Rattle-box	UPL	ǂ	0.5
Alysicarpus ovalifolius	False moneywort	UPL	ǂ	0.3
Desmodium triflorum	Beggarweed	UPL		0.3
Ipomoea quamoclit	Cypressvine	-		0.2
Abutilon theophrasti	Velvetleaf	UPL	ǂ	0.1
Cyperus difformis	Variable flatsedge	OBL	ǂ	0.1
Emilia sonchifolia	Tasselflower	UPL	ǂ	0.1
Eragrostis atrovirens	Thalia lovegrass	FAC	ǂ	0.1
Richardia brasiliensis	Richardia	UPL		0.1
Total Cover of Non-Native Species			**(14)**	**15.5**
Nuisance Species[2]				
Melinis repens	Natalgrass	UPL	ǂ	16.4
Urena lobata	Caesarweed	UPL	ǂ	4.3
Paspalum notatum	Bahia grass	UPL		1.6
Spermacoce verticillata	Shrubby false buttonweed	UPL	ǂ	1.1
Praxelis clematidea	Praxelis	UPL	ǂ	0.5
Cynodon dactylon	Bermuda grass	UPL		0.4
Imperata cylindrica	Cogon grass	UPL	ǂ	0.4
Total Cover of Nuisance Species			**(6)**	**24.7**
Total Species Cover			**54**	**88.4**
Total Bare Ground/Dead Litter				**11.6**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 65: ADDITIONAL SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables(1)			
Carphephorus corymbosus	Florida paintbrush		UPL
Centella asiatica	Asian coinwort		FACW
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Crotalaria rotundifolia	Rabbitbells	ǂ	UPL
Desmodium incanum	Zarzabacao comun	ǂ	UPL
Diodia virginiana	Rough button-weed	ǂ	FACW
Elephantopus elatus	Tall elephantsfoot		UPL
Erechtites hieraciifolius	Fireweed		FAC
Erigeron quercifolius	Oak-leaf fleabane	ǂ	FAC
Froelichia floridana	Cottonweed	ǂ	UPL
Helianthus angustifolius	Narrowleaf sunflower	ǂ	FACW
Hyptis alata	Musky mint	ǂ	FACW
Juncus scirpoides	Needlepod rush		OBL
Lachnanthes caroliniana	Carolina redroot		FAC
Liatris gracilis	Slender goldenrod	ǂ	FAC
Liatris tenuifolia	Shortleaf gayfeather	ǂ	UPL
Licania michauxii	Gopher apple		UPL
Ludwigia repens	Red-leaf ludwigia	ǂ	OBL
Lyonia fruticosa	Coastplain Staggerbush		UPL
Lyonia lucida	Fetterbush		FACW
Muhlenbergia capillaris	Gulf muhly grass	ǂ	OBL
Oxalis corniculata	Yellow wood sorrel	ǂ	UPL
Phyla nodiflora	Frog-fruit	ǂ	FAC
Polygonum hydropiperoides	Mild waterpepper	ǂ	OBL
Pseudognaphalium obtusifolium	Rabbit tobacco		UPL
Pterocaulon pycnostachyum	Blackroot	ǂ	UPL
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	UPL
Sacciolepis striata	American cupscale	ǂ	OBL
Smilax auriculata	Earleaf greenbriar		-
Spartina bakeri	Sand cordgrass		FACW
Yucca filamentosa	Adam's needle		UPL

TABLE 65: ADDITIONAL SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Not Listed in Tables			
Ammannia latifolia	Pink redstem	ǂ	OBL
Blechnum serrulatum	Swamp fern		FACW
Carex elliottii	Elliot's sedge		OBL
Chromolaena odorata	Jack-in-the-bush	ǂ	UPL
Cirsium nuttallii	Nuttall's thistle	ǂ	FACW
Cyperus haspan	Haspan flatsedge	ǂ	OBL
Cyperus strigosus	Straw colored flatsedge	ǂ	FACW
Cyperus virens	Green flatsedge	ǂ	FACW
Eclipta prostrata	Upright burhead	ǂ	FACW
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Lycopodiella cernua	Nodding clubmoss		FACW
Panicum rigidulum	Red-top panic grass	ǂ	FACW
Pluchea baccharis	Rosy camphorweed	ǂ	FACW
Pluchea odorata	Sweetscent	ǂ	FACW
Portulaca pilosa	Pink purslane		UPL
Rubus pensilvanicus	Sawtooth blackberry		FAC
Sagittaria lancifolia	Bulltongue arrowhead	ǂ	OBL
Sesbania vesicaria	Bladderpod		FAC
Solidago sempervirens	Seaside goldenrod		FACW
Stylosanthes biflora	Sidebeak pencilflower	ǂ	UPL
Tillandsia usneoides	Spanish moss		UPL
Vigna luteola	Hairypod cowpea		-
Woodwardia areolata	Netted chain fern		OBL
Woodwardia virginica	Virginia chain fern		FACW
Non-Native Species			
Aeschynomene indica	India joint-vetch	ǂ	FACW
Ceratopteris thalictroides	Watersprite		OBL
Cuphea carthagenensis	Columbian waxweed	ǂ	FAC
Drymaria cordata	West Indian chickweed		FAC
Emilia fosbergii	Florida tasselflower	ǂ	UPL
Hyptis verticillata	John Charles		UPL
Melochia corchorifolia	Chocolate-weed	ǂ	FAC
Paspalum urvillei	Vaseygrass	ǂ	FAC
Senna occidentalis	Septicweed		UPL

TABLE 65: ADDITIONAL SPECIES - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Nuisance Species[2]			
Ludwigia peruviana	Primrose willow	ǂ	OBL
Lygodium japonicum	Japanese climbing fern		-
Macroptilium lathyroides	Phaseolus		-
Momordica charantia	Wild balsam apple		-
Panicum repens	Torpedo grass	ǂ	FACW
Solanum viarum	Tropical soda apple		UPL
Total Additional Species Listed in Tables		**18**	**31**
Total Additional Species Not Listed in Tables		**13**	**24**
Total Additional Non-Native Species		**5**	**9**
Total Additional Nuisance Species		**2**	**6**
Total Additional Species		**38**	**70**

*Native nuisance species

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phospate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 66: TREE DENSITY BY SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Quercus virginiana	Live oak	UPL	2	0	2	27	33.3	55.1	0
Pinus elliottii	Slash pine	UPL	1	0	1	13	16.7	1.9	0
Tree Species Listed In Table Subtotals			**3**	**0**	**3**	**40**	**50.0**	**57.0**	**0**
Tree Species Not Listed in Table									
Quercus nigra	Water oak	UPL	2	0	2	27	33.3	21.5	0
Liquidambar styraciflua	Sweetgum	FACW	1	0	1	13	16.7	4.6	0
Tree Species Not Listed in Table Subtotals			**3**	**0**	**3**	**40**	**50.0**	**26.1**	**0**
TOTALS			**6**	**0**	**6**	**80**	**100.0**	**83.1**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Baccharis halimifolia	Eastern false-willow	FAC	2	0	2	27
Shrub Species Listed in Table Subtotals			**2**	**0**	**2**	**27**
Shrub Species Not Listed in Table						
Callicarpa americana	American beauty-berry	UPL	1	0	1	13
Shrub Species Not Listed in Table Subtotals			**1**	**0**	**1**	**13**
TOTALS			**3**	**0**	**3**	**40**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 67: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Galactia elliotii	Milkpea	UPL		4.2
Panicum hemitomon	Maidencane	OBL		1.9
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	1.3
Baccharis halimifolia	Eastern false-willow	FAC		1.0
Elephantopus elatus	Tall elephantsfoot	UPL	ǂ	0.8
Erechtites hieraciifolius	Fireweed	FAC		0.8
Andropogon virginicus	Broomsedge	FAC	ǂ	0.4
Total Cover of Species Listed in Tables			**(3)**	**10.4**
Species Not Listed in Tables				
Gelsemium sempervirens	Yellow jessamine	UPL		15.9
Smilax bona-nox	Saw greenbrier	UPL		6.3
Commelina diffusa	Dayflower	FACW	ǂ	2.4
Vitis rotundifolia	Muscadine grape	UPL		2.3
Pteridium aquilinum var. pseudocaudatum	Tailed bracken	UPL		1.3
Panicum rigidulum	Red-top panic grass	FACW	ǂ	0.7
Dichanthelium acuminatum	Panic grass	FACW	ǂ	0.6
Callicarpa americana	American beauty-berry	UPL		0.4
Toxicodendron radicans	Poison ivy	UPL		0.4
Total Cover of Species Not Listed in Tables			**(3)**	**30.3**
Non-Native Species				
Pouzolzia zeylanica	Pouzolz's bush	FAC		2.0
Hyptis verticillata	John Charles	UPL		1.9
Emilia fosbergii	Florida tasselflower	UPL	ǂ	0.8
Total Cover of Non-Native Species			**(1)**	**4.7**
Nuisance Species[2]				
Imperata cylindrica	Cogon grass	UPL		19.7
Urena lobata	Caesarweed	UPL		13.3
Lygodium japonicum	Japanese climbing fern	-	ǂ	6.7
Paspalum notatum	Bahia grass	UPL		1.5
Total Cover of Nuisance Species			**(1)**	**41.2**
Total Species Cover			**8**	**86.6**
Total Bare Ground/Dead Litter				**13.4**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 68: ADDITIONAL SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables(1)			
Andropogon glomeratus	Bushy bluestem	ǂ	FACW
Axonopus fissifolius	Southern carpet grass		FAC
Bidens alba (synonym B. pilosa)	White beggar-ticks	ǂ	FAC
Cyperus croceus	Baldwin flatsedge	ǂ	FAC
Desmodium incanum	Zarzabacao comun	ǂ	UPL
Digitaria ciliaris	Southern crabgrass		UPL
Eupatorium capillifolium	Dogfennel		FAC
Euthamia caroliniana	Slender goldenrod		FAC
Gamochaeta pensylvanica	Pennsylvania everlasting	ǂ	UPL
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Lachnocaulon anceps	White-head bogbutton		FACW
Ludwigia maritima	Seaside primrosewillow	ǂ	FACW
Oxalis corniculata	Yellow wood sorrel	ǂ	UPL
Oldenlandia uniflora	Clustered millie graines		FACW
Pteridium aquilinum	Bracken fern		UPL
Rhexia mariana	Meadow-beauty	ǂ	FACW
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	FACW
Scoparia dulcis	Licorice weed	ǂ	FAC
Smilax auriculata	Earleaf greenbriar		UPL
Solidago fistulosa	Pine-barren goldenrod	ǂ	FACW
Species Not Listed in Tables			
Cyperus flavescens	Yellow flatsedge	ǂ	FACW
Juncus effusus	Softrush	ǂ	OBL
Nephrolepis exaltata	Boston fern		FAC
Parthenocissus quinquefolia	Virginia creeper		UPL
Rubus argutus	Sawtooth blackberry		FAC
Tridax procumbens	Coatbuttons	ǂ	UPL
Xyris sp.	Yellow-eyed grass	ǂ	OBL

TABLE 68: ADDITIONAL SPECIES - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Non-Native Species			
Bulbostylis barbata	Watergrass	ǂ	UPL
Desmodium triflorum	Beggarweed	ǂ	UPL
Drymaria cordata	West Indian chickweed		FAC
Indigofera hirsuta	Hairy indigo	ǂ	UPL
Kyllinga brevifolia	Shortleaf spikesedge	ǂ	FACW
Lindernia crustacea	Malaysian false pimpernel	ǂ	FAC
Oldenlandia corymbosa	Flattop mille graines	ǂ	FACW
Sacciolepis indica	Indian cupscale	ǂ	FAC
Nuisance Species[2]			
Cynodon dactylon	Bermuda grass		UPL
Momordica charantia	Wild balsam apple		-
Total Additional Species Listed in Tables		**11**	**20**
Total Additional Species Not Listed in Tables		**4**	**7**
Total Additional Non-Native Species		**7**	**8**
Total Additional Nuisance Species		**0**	**2**
Total Additional Species		**22**	**37**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 69: TREE DENSITY BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	1	0	1	4	7.7	0.2	0
Quercus virginiana	Live oak	UPL	1	0	1	4	7.7	0.1	0
Tree Species Listed In Table Subtotals			**2**	**0**	**2**	**8**	**15.4**	**0.3**	**0**
Tree Species Not Listed in Table									
Quercus laevis	Turkey oak	UPL	4	0	4	16	30.8	<0.05	0
Quercus nigra	Water oak	UPL	3	0	3	12	23.1	0.2	0
Diospyros virginiana	Persimmon	FAC	2	0	2	8	15.4	<0.05	0
Persea borbonia	Red bay	UPL	2	0	2	8	15.4	0.1	0
Tree Species Not Listed in Table Subtotals			**11**	**0**	**11**	**44**	**84.6**	**0.3**	**0**
TOTALS			**13**	**0**	**13**	**52**	**100.0**	**0.6**	**0**

TABLE 69: TREE DENSITY BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[1]						
Serenoa repens	Saw palmetto	UPL	183	0	183	732
Ilex glabra	Gallberry	UPL	61	0	61	244
Quercus pumila	Running oak	UPL	55	0	55	220
Vaccinium myrsinites	Shiny blueberry	UPL	15	0	15	60
Lyonia lucida	Fetterbush	FACW	10	0	10	40
Lyonia fruticosa	Coastplain Staggerbush	UPL	8	0	8	32
Hypericum tetrapetalum	St. John's wort	FAC	6	0	6	24
Baccharis halimifolia	Eastern false-willow	FAC	4	0	4	16
Shrub Species Listed in Table Subtotals			**342**	**0**	**342**	**1368**
Shrub Species Not Listed in Table						
Rhus copallinum	Winged sumac	UPL	59	0	59	236
Vaccinium corymbosum	Highbush blueberry	FACW	15	0	15	60
Callicarpa americana	American beauty-berry	UPL	1	0	1	4
Shrub Species Not Listed in Table Subtotals			**75**	**0**	**75**	**300**
TOTALS			**417**	**0**	**417**	**1668**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[1] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 70: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables(1)				
Aristida stricta	Wiregrass	FAC	ǂ	21.8
Serenoa repens	Saw palmetto	UPL		4.5
Euthamia caroliniana	Slender goldenrod	FAC		4.3
Pteridium aquilinum	Bracken fern	UPL		3.8
Andropogon virginicus	Broomsedge	FAC	ǂ	3.2
Quercus pumila	Running oak	UPL		1.7
Solidago odorata var. chapmanii	Chapman's goldenrod	UPL		1.6
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	1.4
Sorghastrum secundum	lopsided Indiangrass	UPL	ǂ	1.2
Eupatorium mohrii	Eupatorium	FAC	ǂ	0.9
Piloblephis rigida	Wild pennyroyal	UPL	ǂ	0.8
Sabatia brevifolia	Shortleaf rosegentian	FACW	ǂ	0.8
Andropogon sp.	Broomsedge	-	ǂ	0.7
Vaccinium myrsinites	Shiny blueberry	UPL	ǂ	0.7
Lachnocaulon anceps	White-head bogbutton	FACW	ǂ	0.5
Eragrostis elliottii	Elliot's lovegrass	FAC	ǂ	0.4
Paspalum setaceum	Thin paspalum	FAC	ǂ	0.4
Stillingia sylvatica	Queensdelight	FAC	ǂ	0.4
Carphephorus corymbosus	Florida paintbrush	UPL	ǂ	0.3
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.3
Helianthemum corymbosum	Pinebarren frostweed	UPL	ǂ	0.3
Lyonia fruticosa	Coastplain Staggerbush	UPL	ǂ	0.3
Pterocaulon pycnostachyum	Blackroot	UPL		0.3
Solidago fistulosa	Pine-barren goldenrod	FACW	ǂ	0.3
Syngonanthus flavidulus	Bantam-buttons	FACW	ǂ	0.3
Erigeron quercifolius	Oak-leaf fleabane	FAC	ǂ	0.2
Galactia elliotii	Milkpea	UPL		0.1
Scoparia dulcis	Licorice weed	FAC	ǂ	0.1
Smilax auriculata	Earleaf greenbriar	-		0.1
Opuntia humifusa	Pricklypear	UPL		0.1
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	0.1
Total Cover of Species Listed in Tables			**(22)**	**51.9**

TABLE 70: HERBACEOUS COVER BY SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Not Listed in Tables				
Gelsemium sempervirens	Yellow jessamine	-		4.9
Rhus copallinum	Winged sumac	UPL		0.9
Dichanthelium acuminatum	Panic grass	FACW	ǂ	0.7
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.6
Hypericum cistifolium	Round-pod St. John's wort	FACW	ǂ	0.5
Rubus argutus	Sawtooth blackberry	FAC		0.4
Vaccinium corymbosum	Highbush blueberry	FACW		0.4
Vitis rotundifolia	Muscadine grape	-		0.3
Nephrolepis exaltata	Boston fern	FAC		0.1
Panicum rigidulum	Red-top panic grass	FACW	ǂ	0.1
Viola sororia	Common blue violet	FACW		0.1
Total Cover of Species Not Listed in Tables			**(4)**	**9.0**
Non-Native Species				
Bulbostylis barbata	Watergrass	UPL	ǂ	0.3
Sacciolepis indica	Indian cupscale	FAC	ǂ	0.3
Total Cover of Non-Native Species			**(2)**	**0.6**
Nuisance Species[2]				
Paspalum notatum	Bahia grass	UPL	ǂ	6.1
Imperata cylindrica	Cogon grass	UPL		0.6
Urena lobata	Caesarweed	UPL		0.1
Total Cover of Nuisance Species			**(1)**	**6.8**
Total Species Cover			**29**	**68.3**
Total Bare Ground/Dead Litter				**32.2**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 71: ADDITIONAL SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables(1)			
Agalinis fasciculata	Beach False-foxglove	ǂ	FACW
Aristida spiciformis	Pinebarren three-awn		FAC
Asimina obovata	Bigflower pawpaw		-
Buchnera americana	American bluehearts	ǂ	UPL
Centella asiatica	Asian coinwort		FACW
Chamaecrista nictitans	Wild sensitive plant		UPL
Cyperus croceus	Baldwin flatsedge	ǂ	FAC
Dichanthelium portoricense	Hemlock witchgrass	ǂ	UPL
Eleocharis baldwinii	Baldwin's spikerush		OBL
Eragrostis spectabilis	Purple lovegrass	ǂ	FAC
Erechtites hieraciifolius	Fireweed	ǂ	FAC
Eryngium aromaticum	Fragrant eryngo	ǂ	UPL
Eupatorium capillifolium	Dogfennel		FAC
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Hyptis alata	Musky mint		FACW
Juncus scirpoides	Needlepod rush		OBL
Liatris gracilis	Slender goldenrod	ǂ	FAC
Ludwigia repens	Red-leaf ludwigia		OBL
Oldenlandia uniflora	Clustered millie graines		FACW
Panicum hemitomon	Maidencane		OBL
Rhexia mariana	Meadow-beauty	ǂ	FACW
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	FACW
Sabal palmetto	Cabbage palm		FAC
Utricularia subulata	Bladderwort	ǂ	OBL
Yucca filamentosa	Adam's needle		UPL

TABLE 71: ADDITIONAL SPECIES - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Not Listed in Tables			
Croton michauxii	Rushfoil	ǂ	UPL
Heterotheca subaxillaris	Camphorweed	ǂ	UPL
Lechea deckertii	Deckert's pinweed		-
Ludwigia octovalvis	Large seedbox	ǂ	OBL
Polypremum procumbens	Rustweed	ǂ	FAC
Rhynchospora microcarpa	Southern beakrush	ǂ	OBL
Rubus cuneifolius	Sand Blackberry		FAC
Schizachyrium stoloniferum	Creeping little bluestem	ǂ	FAC
Sesbania herbacea	Danglepod		FAC
Smilax bona-nox	Saw greenbrier		-
Vicia acutifolia	Four-leaf vetch		FACW
Woodwardia virginica	Virginia chain fern		FACW
Non-Native Species			
Commelina gambiae	Gambian dayflower	ǂ	FACW
Crotalaria spectabilis	Rattle-box	ǂ	UPL
Nuisance Species[2]			
Macroptilium lathyroides	Phaseolus		-
Total Additional Species Listed in Tables		**11**	**25**
Total Additional Species Not Listed in Tables		**6**	**12**
Total Additional Non-Native Species		**2**	**2**
Total Additional Nuisance Species		**0**	**1**
Total Additional Species		**19**	**40**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 72: TREE DENSITY BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Pinus elliottii	Slash pine	UPL	25	9	34	68	77.3	20.2	2
Myrica cerifera	Wax myrtle	FAC	4	0	4	8	9.1	0.1	0
Quercus laurifolia	Laurel oak	FACW	2	0	2	4	4.6	0.1	0
Quercus virginiana	Live oak	UPL	2	0	2	4	4.6	<0.05	0
Tree Species Listed In Table Subtotals			**33**	**9**	**42**	**84**	**95.5**	**20.4**	**2**
Tree Species Not Listed in Table									
Quercus geminata	Sand live oak	UPL	2	0	2	4	4.6	<0.05	0
Tree Species Not Listed in Table Subtotals			**2**	**0**	**2**	**4**	**4.55**	**<0.05**	**0**
TOTALS			**35**	**9**	**44**	**88**	**100.0**	**20.4**	**2**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	32	0	32	64
Hypericum tetrapetalum	St. John's wort	FAC	20	0	20	40
TOTAL			**52**	**0**	**52**	**104**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 73: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Scoparia dulcis	Licorice weed	FAC	ǂ	3.7
Axonopus fissifolius	Southern carpet grass	FAC		3.6
Eupatorium capillifolium	Dogfennel	FAC		3.3
Euthamia caroliniana	Slender goldenrod	FAC		1.9
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	1.3
Andropogon virginicus	Broomsedge	FAC	ǂ	0.9
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.8
Paspalum setaceum	Thin paspalum	FAC	ǂ	0.8
Fimbristylis autumnalis	Fringe-rush	OBL	ǂ	0.7
Sacciolepis striata	American cupscale	OBL	ǂ	0.7
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	0.7
Hydrocotyle umbellata	Manyflower marshpennywort	FACW		0.6
Panicum rigidulum	Red-top panic grass	FACW	ǂ	0.6
Helianthemum corymbosum	Pinebarren frostweed	UPL	ǂ	0.5
Hypericum tetrapetalum	St. John's wort	FAC	ǂ	0.5
Oxalis corniculata	Yellow wood sorrel	UPL	ǂ	0.5
Serenoa repens	Saw palmetto	UPL		0.5
Crotalaria rotundifolia	Rabbitbells	UPL	ǂ	0.4
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.4
Gamochaeta pensylvanica	Pennsylvania everlasting	UPL	ǂ	0.4
Desmodium incanum	Zarzabacao comun	UPL	ǂ	0.3
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.3
Ludwigia repens	Red-leaf ludwigia	OBL		0.3
Muhlenbergia capillaris	Gulf muhly grass	OBL	ǂ	0.3
Polygonum punctatum	Dotted smartweed	OBL	ǂ	0.3
Acalypha gracilens	Slender threeseed mercury	UPL	ǂ	0.2
Chamaecrista nictitans	Wild sensitive plant	UPL		0.2
Croton michauxii	Rushfoil	UPL	ǂ	0.2
Elephantopus elatus	Tall elephantsfoot	UPL		0.2

TABLE 73: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables (continued)				
Galactia elliotii	Milkpea	UPL		0.2
Oldenlandia uniflora	Clustered millie graines	FACW		0.2
Polygonum hydropiperoides	Mild waterpepper	OBL	ǂ	0.2
Pterocaulon pycnostachyum	Blackroot	UPL		0.2
Solidago fistulosa	Pine-barren goldenrod	FACW	ǂ	0.2
Ambrosia artemisiifolia	Common ragweed	UPL		0.1
Carex longii	Long's sedge	FACW	ǂ	0.1
Centella asiatica	Asian coinwort	FACW		0.1
Erechtites hieraciifolius	Fireweed	FAC	ǂ	0.1
Eupatorium mohrii	Eupatorium	FAC		0.1
Eupatorium rotundifolium	False hoarhound	FAC	ǂ	0.1
Juncus marginatus	Grassleaf rush	FACW	ǂ	0.1
Liatris gracilis	Slender goldenrod	FAC	ǂ	0.1
Opuntia humifusa	Pricklypear	UPL		0.1
Panicum hemitomon	Maidencane	OBL		0.1
Phyla nodiflora	Frog-fruit	FAC	ǂ	0.1
Sesbania herbacea	Danglepod	FAC	ǂ	0.1
Sida rhombifolia	Indian hemp	UPL	ǂ	0.1
Total Cover of Species Listed in Tables			**(31)**	**27.4**
Species Not Listed in Tables				
Dichanthelium acuminatum	Panic grass	FACW	ǂ	4.4
Aeschynomene americana	Meadow joint-vetch	UPL	ǂ	3.0
Conyza canadensis	Dwarf horseweed	UPL		1.8
Polypremum procumbens	Rustweed	FAC	ǂ	1.7
Fimbristylis dichotoma	Forked fimbry	OBL	ǂ	0.3
Chamaesyce hyssopifolia	Hyssopleaf sandmat	UPL	ǂ	0.2
Smilax bona-nox	Saw greenbrier	-		0.2
Commelina diffusa	Dayflower	FACW	ǂ	0.1
Cyperus virens	Green flatsedge	FACW	ǂ	0.1
Ludwigia octovalvis	Large seedbox	OBL	ǂ	0.1
Rhododendron viscosum	Swamp azalea	FACW	ǂ	0.1
Sagittaria lancifolia	Bulltongue arrowhead	OBL	ǂ	0.1
Total Cover of Species Not Listed in Tables			**(10)**	**12.1**

TABLE 73: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Non-Native Species				
Indigofera hirsuta	Hairy indigo	UPL	ǂ	4.0
Phyllanthus urinaria	Chamberbitter	FAC	ǂ	2.7
Alysicarpus ovalifolius	False moneywort	UPL	ǂ	2.2
Desmodium triflorum	Beggarweed	UPL	ǂ	1.8
Lindernia crustacea	Malaysian false pimpernel	FAC	ǂ	1.3
Sporobolus indicus	Smutgrass	UPL	ǂ	0.9
Crotalaria pallida	Smooth rattle-box	UPL	ǂ	0.8
Bulbostylis barbata	Watergrass	UPL	ǂ	0.4
Murdannia nudiflora	Naked-stem dewflower	FAC		0.3
Abutilon theophrasti	Velvetleaf	UPL	ǂ	0.2
Emilia sonchifolia	Tasselflower	UPL	ǂ	0.1
Sacciolepis indica	Glenwood grass	FAC	ǂ	0.1
Total Cover of Non-Native Species			**(11)**	**14.8**
Nuisance Species[(2)]				
Paspalum notatum	Bahia grass	UPL	ǂ	8.3
Urena lobata	Caesarweed	UPL	ǂ	4.7
Cynodon dactylon	Bermuda grass	UPL		0.6
Imperata cylindrica	Cogon grass	UPL		0.1
Macroptilium lathyroides	Phaseolus	-	ǂ	0.1
Praxelis clematidea	Praxelis	UPL	ǂ	0.1
Total Cover of Nuisance Species			**(4)**	**13.9**
Total Species Cover			**56**	**68.2**
Total Bare Ground/Dead Litter				**32.4**

*Native nuisance species

[(1)] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[(2)] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 74: ADDITIONAL SPECIES - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Aristida stricta	Wiregrass		FAC
Buchnera americana	American bluehearts	ǂ	UPL
Chamaecrista fasciculata	Partridge-pea		UPL
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Helianthus angustifolius	Narrowleaf sunflower	ǂ	FACW
Hypoxis juncea	Yellow star grass		FACW
Cyperus retrorsus	Musky mint		FACW
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Pityopsis graminifolia	Narrowleaf silkgrass	ǂ	UPL
Ptilimnium capillaceum	Bishop-weed	ǂ	FACW
Scleria ciliata var. ciliata	Fringed nutrush	ǂ	FACW
Smilax auriculata	Earleaf greenbriar		-
Vaccinium myrsinites	Shiny blueberry		UPL
Xyris sp.	Yellow-eyed grass	ǂ	OBL
Yucca filamentosa	Adam's needle		UPL
Species Not Listed in Tables			
Amphicarpum muehlenbergianum	Blue maidencane		FACW
Asimina obovata	Bigflower pawpaw		-
Boehmeria cylindrica	Small-spike false nettle	ǂ	OBL
Cirsium nuttallii	Nuttall's thistle	ǂ	FACW
Portulaca pilosa	Pink purslane	ǂ	UPL
Salvia coccinea	Blood sage		OBL
Symphyotrichum bahamense	Annual saltmarsh aster	ǂ	OBL
Woodwardia virginica	Virginia chain fern		FACW
Non-Native Species			
Aeschynomene indica	India joint-vetch		FACW
Commelina gambiae	Gambian dayflower	ǂ	FACW
Cyperus lanceolatus	Epiphytic flatsedge	ǂ	OBL
Kyllinga brevifolia	Shortleaf spikesedge	ǂ	FACW
Melochia corchorifolia	Chocolate-weed	ǂ	FAC
Oldenlandia corymbosa	Flattop mille graines	ǂ	FACW
Pouzolzia zeylanica	Pouzolz's bush		FAC
Richardia brasiliensis	Richardia	ǂ	UPL
Nuisance Species[2]			
Ludwigia peruviana	Primrose willow	ǂ	OBL
Melinis repens	Natalgrass	ǂ	UPL
Mikania scandens	Climbing hempvine	ǂ	-*
Spermacoce verticillata	Shrubby false buttonweed	ǂ	UPL
Total Additional Species Listed in Tables		**8**	**15**
Total Additional Species Not Listed in Tables		**4**	**8**
Total Additional Non-Native Species		**6**	**8**
Total Additional Nuisance Species		**4**	**4**
Total Additional Species		**22**	**35**

*Native nuisance species

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 75: TREE DENSITY BY SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	11	0	11	147	37.9	0.7	0
Pinus elliottii	Slash pine	UPL	7	4	11	147	37.9	24.8	0
Quercus virginiana	Live oak	UPL	1	0	1	13	3.5	4.1	0
Tree Species Listed In Table Subtotals			**19**	**4**	**23**	**307**	**79.3**	**29.6**	**0**
Tree Species Not Listed in Table									
Ilex cassine	Dahoon holly	OBL	3	0	3	40	10.3	<0.05	0
Magnolia virginiana	Sweetbay	OBL	3	0	3	40	10.3	<0.05	0
Tree Species Not Listed in Table Subtotals			**6**	**0**	**6**	**80**	**20.7**	**<0.05**	**0**
TOTALS			**25**	**4**	**29**	**387**	**100.0**	**29.6**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	2	0	2	27
TOTAL			**2**	**0**	**2**	**27**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 76: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Xyris sp.	Yellow-eyed grass	OBL	ǂ	9.6
Euthamia caroliniana	Slender goldenrod	FAC		5.9
Panicum hemitomon	Maidencane	OBL		4.2
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	2.9
Andropogon virginicus	Broomsedge	FAC	ǂ	2.8
Solidago fistulosa	Pine-barren goldenrod	FACW		2.1
Helianthus angustifolius	Narrowleaf sunflower	FACW		1.3
Myrica cerifera	Wax myrtle	FAC		1.3
Vitis rotundifolia	Muscadine grape	-		1.3
Pterocaulon pycnostachyum	Blackroot	UPL		1.1
Rhexia mariana	Meadow-beauty	FACW	ǂ	1.0
Scoparia dulcis	Licorice weed	FAC	ǂ	1.0
Crotalaria rotundifolia	Rabbitbells	UPL	ǂ	0.8
Juncus scirpoides	Needlepod rush	OBL	ǂ	0.8
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	0.4
Coreopsis leavenworthii	Leavenworth's tickseed	FACW	ǂ	0.4
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.4
Cyperus strigosus	Straw colored flatsedge	FACW	ǂ	0.4
Eupatorium capillifolium	Dogfennel	FAC		0.4
Hydrocotyle umbellata	Manyflower marshpennywort	FACW		0.4
Paspalum setaceum	Thin paspalum	FAC	ǂ	0.4
Total Cover of Species Listed in Tables			**(12)**	**38.9**
Species Not Listed in Tables				
Osmunda cinnamomea	Cinnamon fern	FACW	ǂ	11.3
Smilax bona-nox	Saw greenbrier	-		2.9
Dichanthelium acuminatum	Panic grass	FACW	ǂ	1.7
Polypremum procumbens	Rustweed	FAC	ǂ	1.0
Toxicodendron radicans	Poison ivy	-		0.4
Total Cover of Species Not Listed in Tables			**(3)**	**17.3**
Non-Native Species				
Desmodium triflorum	Beggarweed	UPL	ǂ	2.1
Indigofera hirsuta	Hairy indigo	UPL	ǂ	1.9
Total Cover of Non-Native Species			**(2)**	**4.0**
Nuisance Species[2]				
Paspalum notatum	Bahia grass	UPL	ǂ	19.9
Urena lobata	Caesarweed	UPL	ǂ	0.4
Total Cover of Nuisance Species			**(2)**	**20.3**
Total Species Cover			**19**	**80.5**
Total Bare Ground/Dead Litter				**19.6**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 77: ADDITIONAL SPECIES - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Aristida spiciformis	Pinebarren three-awn	ǂ	FAC
Axonopus furcatus	Flat-joint carpet grass	ǂ	FAC
Carex longii	Long's sedge	ǂ	FACW
Elephantopus elatus	Tall elephantsfoot	ǂ	UPL
Eragrostis elliottii	Elliot's lovegrass	ǂ	FAC
Eupatorium mohrii	Eupatorium	ǂ	FAC
Galactia elliotii	Milkpea		UPL
Gamochaeta pensylvanica	Pennsylvania everlasting	ǂ	UPL
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Hyptis alata	Musky mint	ǂ	FACW
Juncus marginatus	Grassleaf rush	ǂ	FACW
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Lachnanthes caroliniana	Carolina redroot	ǂ	FAC
Ludwigia maritima	Seaside primrosewillow	ǂ	FACW
Panicum rigidulum	Red-top panic grass	ǂ	FACW
Pityopsis graminifolia	Narrowleaf silkgrass		UPL
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	FACW
Rubus argutus	Sawtooth blackberry		FAC
Smilax auriculata	Earleaf greenbriar		-
Vaccinium myrsinites	Shiny blueberry		UPL
Xyris caroliniana	Carolina yelloweyed grass	ǂ	FACW
Species Not Listed in Tables			
Osmunda regalis	Royal fern		OBL
Pluchea baccharis	Rosy camphorweed	ǂ	FACW
Rhynchospora microcarpa	Southern beakrush	ǂ	OBL
Symphyotrichum bahamense	Annual saltmarsh aster	ǂ	OBL
Tripsacum dactyloides	Fakahatchee grass		FAC
Woodwardia virginica	Virginia chain fern		FACW
Non-Native Species			
Hyptis verticillata	John Charles		UPL
Lindernia crustacea	Malaysian false pimpernel	ǂ	FAC
Sacciolepis indica	Glenwood grass	ǂ	FAC
Nuisance Species[2]			
Imperata cylindrica	Cogon grass	ǂ	UPL
Total Additional Species Listed in Tables		**16**	**21**
Total Additional Species Not Listed in Tables		**3**	**6**
Total Additional Exotic Species		**2**	**3**
Total Additional Nuisance Species		**1**	**1**
Total Additional Species		**22**	**31**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 78: TREE DENSITY BY SPECIES - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Quercus virginiana	Live oak	UPL	8	0	8	80	49.9	68.0	30
Quercus laurifolia	Laurel oak	FACW	1	1	2	20	12.5	6.8	0
Quercus nigra	Water oak	UPL	1	0	1	10	6.3	9.1	0
Tree Species Listed In Table Subtotals			**10**	**1**	**11**	**110**	**68.7**	**83.9**	**30**
Tree Species Not Listed in Table									
Persea borbonia	Red bay	UPL	5	0	5	50	31.3	0.7	0
Tree Species Not Listed in Table Subtotals			**5**	**0**	**5**	**50**	**31.3**	**0.7**	**0**
TOTALS			**15**	**1**	**16**	**160**	**100.0**	**84.6**	**30**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	49	0	49	490
Ilex glabra	Gallberry	UPL	28	0	28	280
Hypericum tetrapetalum	St. John's wort	FAC	9	0	9	90
TOTALS			**86**	**0**	**86**	**860**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 79: HERBACEOUS COVER BY SPECIES - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Panicum rigidulum	Red-top panic grass	FACW	ǂ	10.6
Andropogon ternarius	Splitbread bluestem	UPL	ǂ	7.4
Vitis rotundifolia	Muscadine grape	-		5.9
Aristida stricta	Wiregrass	FAC		5.0
Andropogon virginicus	Broomsedge	FAC	ǂ	3.8
Gelsemium sempervirens	Yellow jessamine	-		3.8
Serenoa repens	Saw palmetto	UPL		3.0
Euthamia caroliniana	Slender goldenrod	FAC		2.4
Lachnocaulon anceps	White-head bogbutton	FACW	ǂ	1.3
Rhynchospora fascicularis	Fasciculate beakrush	FACW	ǂ	1.3
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	0.8
Quercus virginiana	Live oak	UPL		0.8
Ilex glabra	Gallberry	UPL		0.6
Liatris gracilis	Slender goldenrod	FAC	ǂ	0.6
Solidago fistulosa	Pine-barren goldenrod	FACW		0.6
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	0.5
Xyris sp.	Yellow-eyed grass	OBL	ǂ	0.3
Total Cover of Species Listed in Table			**(9)**	**48.7**
Species Not Listed in Tables				
Schizachyrium stoloniferum	Creeping little bluestem	FAC		7.5
Osmunda regalis	Royal fern	OBL		4.1
Smilax bona-nox	Saw greenbrier	-		1.3
Dichanthelium acuminatum	Panic grass	FACW	ǂ	0.9
Persea borbonia	Red bay	UPL		0.6
Woodwardia virginica	Virginia chain fern	FACW		0.3
Total Cover of Species Not Listed in Table			**(1)**	**14.7**
Non-Native Species				
Crotalaria spectabilis	Rattle-box	UPL		0.3
Total Cover of Non-Native Species			**(0)**	**0.3**
Total Species Cover			**10**	**63.7**
Total Bare Ground/Dead Litter				**36.4**

*Native nuisance species

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 80: ADDITIONAL SPECIES - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Aristida spiciformis	Pinebarren three-awn	ǂ	FAC
Callicarpa americana	American beauty-berry		UPL
Hypoxis juncea	Yellow stargrass	ǂ	UPL
Polygala rugelii	Yellow milkwort	ǂ	FAC
Erechtites hieraciifolius	Fireweed		FAC
Eupatorium mohrii	Eupatorium	ǂ	FAC
Galactia elliotii	Milkpea		UPL
Helianthus angustifolius	Narrowleaf sunflower	ǂ	FACW
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Hypoxis juncea	Yellow star grass	ǂ	FACW
Hyptis alata	Musky mint	ǂ	FACW
Juncus megacephalus	Bighead rush	ǂ	OBL
Juncus scirpoides	Needlepod rush	ǂ	OBL
Lachnanthes caroliniana	Carolina redroot	ǂ	FAC
Ludwigia maritima	Seaside primrosewillow		FACW
Ludwigia repens	Red-leaf ludwigia		OBL
Pityopsis graminifolia	Narrowleaf silkgrass	ǂ	UPL
Rhus copallinum	Winged sumac		UPL
Rubus argutus	Sawtooth blackberry		FAC
Scoparia dulcis	Licorice weed	ǂ	FAC
Smilax auriculata	Earleaf greenbriar		-
Syngonanthus flavidulus	Bantam-buttons	ǂ	FACW
Tillandsia usneoides	Spanish moss		UPL
Vaccinium myrsinites	Shiny blueberry	ǂ	UPL
Erigeron quercifolius	Oak-leaf fleabane	ǂ	FAC
Species Not Listed in Tables			
Asimina obovata	Bigflower pawpaw		-
Osmunda cinnamomea	Cinnamon fern		FACW
Eriocaulon decangulare	Ten-angle pipewort		OBL
Nephrolepis exaltata	Boston fern		FAC
Vicia acutifolia	Four-leaf vetch		FACW
Non-Native Species			
Sacciolepis indica	Glenwood grass	ǂ	FAC
Nuisance Species[2]			
Urena lobata	Caesarweed		UPL
Total Additional Species Listed in Tables		**16**	**25**
Total Additional Species Not Listed in Tables		**0**	**5**
Total Additional Non-Native Species		**1**	**1**
Total Additional Nuisance Species		**0**	**1**
Total Additional Species		**17**	**32**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 81: TREE DENSITY BY SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Myrica cerifera	Wax myrtle	FAC	8	0	8	46	47.1	3.9	0
Acer rubrum	Red maple	FACW	4	0	4	23	23.5	<0.05	0
Pinus elliottii	Slash pine	UPL	4	0	4	23	23.5	7.2	0
Tree Species Listed In Table Subtotals			**16**	**0**	**16**	**92**	**94.1**	**11.1**	**0**
Tree Species Not Listed in Table									
Salix caroliniana	Southern willow	OBL	1	0	1	6	5.9	2.1	0
Tree Species Not Listed in Table Subtotals			**1**	**0**	**1**	**6**	**5.9**	**2.1**	**0**
TOTAL			**17**	**0**	**17**	**98**	**100.0**	**13.2**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	5	0	5	29
Baccharis halimifolia	Eastern false-willow	FAC	4	0	4	23
TOTAL			**9**	**0**	**9**	**52**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 82: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Bidens alba (synonym B. pilosa)	White beggar-ticks	FAC	ǂ	7.7
Eupatorium capillifolium	Dogfennel	FAC		5.0
Scoparia dulcis	Licorice weed	FAC	ǂ	3.1
Hydrocotyle umbellata	Manyflower marshpennywort	FACW		1.8
Commelina diffusa	Dayflower	FACW	ǂ	0.4
Digitaria ciliaris	Southern crabgrass	UPL	ǂ	0.4
Myrica cerifera	Wax myrtle	FAC		0.2
Total Cover of Species Listed in Table			**(4)**	**18.6**
Species Not Listed in Tables				
Ludwigia octovalvis	Large seedbox	OBL	ǂ	6.6
Aeschynomene americana	Meadow joint-vetch	UPL	ǂ	5.3
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	3.8
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	3.2
Cyperus compressus	Poorland flatsedge	FACW	ǂ	2.0
Solidago sempervirens	Seaside goldenrod	FACW	ǂ	1.3
Conyza canadensis	Dwarf horseweed	UPL		1.1
Boehmeria cylindrica	Small-spike false nettle	OBL	ǂ	0.7
Polygonum punctatum	Dotted smartweed	OBL	ǂ	0.5
Rubus pensilvanicus	Sawtooth blackberry	FAC		0.5
Paspalum dilatatum	Dallisgrass	FAC	ǂ	0.4
Total Cover of Species Not Listed in Table			**(9)**	**25.4**
Non-Native Species				
Alysicarpus ovalifolius	False moneywort	UPL	ǂ	12.0
Hyptis verticillata	John Charles	UPL		2.3
Cyperus alopecuroides	Foxtail flatsedge	FACW	ǂ	0.7
Lindernia crustacea	Malaysian false pimpernel	FAC	ǂ	0.7
Sacciolepis indica	Glenwood grass	FAC	ǂ	0.5
Indigofera hirsuta	Hairy indigo	UPL	ǂ	0.4
Cyperus lanceolatus	Epiphytic flatsedge	OBL	ǂ	0.2
Total Cover of Non-Native Species			**(6)**	**16.8**
Nuisance Species[2]				
Urena lobata	Caesarweed	UPL	ǂ	10.2
Mikania scandens	Climbing hempvine	-*	ǂ	8.0
Paspalum notatum	Bahia grass	UPL	ǂ	6.1
Melinis repens	Natalgrass	UPL	ǂ	3.6
Panicum repens	Torpedo grass	FACW		1.4
Typha sp.	Cattail	OBL		0.5
Praxelis clematidea	Praxelis	UPL	ǂ	0.4
Total Cover of Nuisance Species			**(5)**	**30.2**
Total Species Cover			**24**	**91.0**
Total Bare Ground/Dead Litter				**9.3**

*Native nuisance species

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 83: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables(1)			
Ambrosia artemisiifolia	Common ragweed		UPL
Andropogon virginicus	Broomsedge	ǂ	FAC
Drymaria cordata	West Indian chickweed		FAC
Eragrostis elliottii	Elliot's lovegrass	ǂ	FAC
Erechtites hieraciifolius	Fireweed		FAC
Species Not Listed in Tables			
Asclepias curassavica	Scarlet milkweed		UPL
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Cyperus ligularis	Swamp flatsedge	ǂ	FACW
Cyperus odoratus	Fragrant flatsedge	ǂ	FACW
Eclipta prostrata	Upright burhead	ǂ	FACW
Eleocharis interstincta	Knotted spikerush		OBL
Eupatorium serotinum	Late-flowering thorough-wort		FAC
Euthamia caroliniana	Slender goldenrod		FAC
Ludwigia maritima	Seaside primrosewillow	ǂ	FACW
Ludwigia repens	Red-leaf ludwigia		OBL
Lythrum alatum	Winged lythrum	ǂ	OBL
Physalis angulata	Cutleaf ground cherry		UPL
Polypremum procumbens	Rustweed	ǂ	FAC
Pseudognaphalium obtusifolium	Rabbit tobacco		UPL
Sagittaria lancifolia	Bulltongue arrowhead	ǂ	OBL
Salix caroliniana	Southern willow		OBL
Schoenoplectus tabernaemontani	Softstem bulrush		OBL
Sesbania herbacea	Danglepod	ǂ	FAC
Symphyotrichum bahamense	Annual saltmarsh aster	ǂ	OBL

TABLE 83: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Non-Native Species			
Bulbostylis barbata	Watergrass	ǂ	UPL
Ceratopteris thalictroides	Watersprite		OBL
Crotalaria pallida	Smooth rattle-box		UPL
Kyllinga brevifolia	Shortleaf spikesedge	ǂ	FACW
Melochia corchorifolia	Chocolate-weed	ǂ	FAC
Paspalum urvillei	Vaseygrass	ǂ	FAC
Richardia brasiliensis	Richardia	ǂ	UPL
Sporobolus indicus	Smutgrass	ǂ	UPL
Nuisance Species[(2)]			
Cynodon dactylon	Bermuda grass	ǂ	UPL
Hymenachne amplexicaulis	Trompetilla	ǂ	OBL
Imperata cylindrica	Cogon grass	ǂ	UPL
Ludwigia peruviana	Primrose willow		OBL
Ricinus communis	Castor bean	ǂ	UPL
Solanum viarum	Tropical soda apple		UPL
Spermacoce verticillata	Shrubby false buttonweed	ǂ	UPL
Total Additional Species Listed in Tables		**2**	**5**
Total Additional Species Not Listed in Tables		**10**	**19**
Total Additional Non-Native Species		**6**	**8**
Total Additional Nuisance Species		**5**	**7**
Total Additional Species		**23**	**39**

[(1)] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[(2)] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 84: TREE DENSITY BY SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Pinus elliottii	Slash pine	UPL	8	1	9	120	42.9	7.8	0
Liquidambar styraciflua	Sweetgum	FACW	5	0	5	67	23.8	9.1	0
Quercus virginiana	Live oak	UPL	3	0	3	40	14.3	67.0	0
Quercus laurifolia	Laurel oak	FACW	2	0	2	27	9.5	4.4	0
Myrica cerifera	Wax myrtle	FAC	1	0	1	13	4.8	0.0	0
Sabal palmetto	Cabbage palm	FAC	1	0	1	13	4.8	1.5	0
TOTAL			**20**	**1**	**21**	**280**	**100.0**	**89.8**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table [2]						
Hypericum hypericoides	St. Andrews cross	FAC	1	0	1	13
Shrub Species Listed in Table Subtotals			**1**	**0**	**1**	**13**
Shrub Species Not Listed in Table						
Hypericum cistifolium	Round-pod St. John's wort	FACW	2	0	2	27
Shrub Species Not Listed in Table Subtotals			**2**	**0**	**2**	**27**
TOTALS			**3**	**0**	**3**	**40**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 85: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Gelsemium sempervirens	Yellow jessamine	-		14.3
Smilax bona-nox	Saw greenbrier	-		6.7
Vitis rotundifolia	Muscadine grape	-		4.1
Andropogon virginicus	Broomsedge	FAC	ǂ	2.5
Elephantopus elatus	Tall elephantsfoot	UPL	ǂ	1.7
Paspalum floridanum	Florida paspalum	FACW	ǂ	0.9
Solidago fistulosa	Pine-barren goldenrod	FACW	ǂ	0.8
Cyperus croceus	Baldwin flatsedge	FAC	ǂ	0.4
Eupatorium capillifolium	Dogfennel	FAC		0.4
Parthenocissus quinquefolia	Virginia creeper	-		0.4
Rubus argutus	Sawtooth blackberry	FAC		0.4
Toxicodendron radicans	Poison ivy	-		0.4
Total Cover of Species Listed in Table			**(5)**	**33.0**
Species Not Listed in Table				
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	5.4
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	3.2
Dichanthelium acuminatum	Panic grass	FACW	ǂ	1.7
Juncus effusus	Softrush	OBL	ǂ	1.1
Hypericum cistifolium	Round-pod St. John's wort	FACW	ǂ	0.8
Nephrolepis exaltata	Boston fern	FAC		0.4
Total Cover of Species Not Listed in Table			**(5)**	**12.6**
Non-Native Species				
Zingiber zerumbet	Bitter ginger	UPL		10.8
Sacciolepis indica	Glenwood grass	FAC	ǂ	0.8
Total Cover of Non-Native Species			**(1)**	**11.6**
Nuisance Species[2]				
Urena lobata	Caesarweed	UPL	ǂ	4.4
Paspalum notatum	Bahia grass	UPL	ǂ	3.6
Total Cover of Nuisance Species			**(2)**	**8.0**
Total Species Cover			**13**	**65.2**
Total Bare Ground/Dead Litter				**34.8**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 86: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Bidens alba (synonym B. pilosa)	White beggar-ticks	ǂ	FAC
Chasmanthium laxum	Slender spikegrass	ǂ	FACW
Commelina diffusa	Dayflower	ǂ	FACW
Desmodium incanum	Zarzabacao comun	ǂ	UPL
Digitaria ciliaris	Southern crabgrass	ǂ	UPL
Drymaria cordata	West Indian chickweed		FAC
Erechtites hieraciifolius	Fireweed	ǂ	FAC
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Hypericum hypericoides	St. Andrews cross	ǂ	FAC
Oxalis corniculata	Yellow wood sorrel	ǂ	UPL
Panicum hemitomon	Maidencane		OBL
Scoparia dulcis	Licorice weed	ǂ	FAC
Species Not Listed in Tables			
Cyperus flavescens	Yellow flatsedge	ǂ	FACW
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Lobelia glandulosa	Glade lobelia	ǂ	FACW
Ludwigia maritima	Seaside primrosewillow	ǂ	FACW
Rhexia mariana	Meadow-beauty	ǂ	FACW
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	FACW
Woodwardia areolata	Netted chain fern		OBL
Woodwardia virginica	Virginia chain fern		FACW
Xyris sp.	Yellow-eyed grass	ǂ	OBL
Non-Native Species			
Bulbostylis barbata	Watergrass	ǂ	UPL
Desmodium triflorum	Beggarweed	ǂ	UPL
Hyptis verticillata	John Charles		UPL
Kyllinga brevifolia	Shortleaf spikesedge	ǂ	FACW
Lindernia crustacea	Malaysian false pimpernel	ǂ	FAC
Oldenlandia corymbosa	Flattop mille graines	ǂ	FACW
Nuisance Species [2]			
Cynodon dactylon	Bermuda grass		UPL
Lygodium japonicum	Japanese climbing fern		-
Momordica charantia	Wild balsam apple		-
Total Additional Species Listed in Tables		**9**	**12**
Total Additional Species Not Listed in Tables		**7**	**9**
Total Additional Non-Native Species		**5**	**6**
Total Additional Nuisance Species		**0**	**3**
Total Additional Species		**21**	**30**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 87: TREE DENSITY BY SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	PERCENT CANOPY COVER	SEEDLING
			LIVE	STRESSED					
Tree Species Listed in Table[1]									
Quercus laurifolia	Laurel oak	FACW	12	1	13	130	50.1	47.8	0
Persea borbonia	Red bay	UPL	8	0	8	80	30.8	0.4	0
Quercus nigra	Water oak	UPL	3	0	3	30	11.5	3.9	0
Tree Species Listed In Table Subtotals			**23**	**1**	**24**	**240**	**92.4**	**52.1**	**0**
Tree Species Not Listed in Table									
Ilex cassine	Dahoon holly	OBL	1	0	1	10	3.8	0.7	0
Magnolia virginiana	Sweetbay	OBL	0	1	1	10	3.8	0.5	0
Tree Species Not Listed in Table Subtotals			**1**	**1**	**2**	**20**	**7.6**	**1.2**	**0**
TOTALS			**24**	**2**	**26**	**260**	**100.0**	**53.3**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[2]						
Serenoa repens	Saw palmetto	UPL	30	0	30	300
Callicarpa americana	American beauty-berry	UPL	2	0	2	20
Baccharis halimifolia	Eastern false-willow	FAC	1	0	1	10
Shrub Species Listed in Table Subtotals			**33**	**0**	**33**	**330**
Shrub Species Not Listed in Table						
Ilex glabra	Gallberry	UPL	12	0	12	120
Shrub Species Not Listed in Table Subtotals			**12**	**0**	**12**	**120**
TOTALS			**45**	**0**	**45**	**450**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 88: HERBACEOUS COVER BY SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Vitis rotundifolia	Muscadine grape	-		3.8
Panicum hemitomon	Maidencane	OBL		3.4
Serenoa repens	Saw palmetto	UPL		2.8
Eupatorium capillifolium	Dogfennel	FAC		1.9
Drymaria cordata	West Indian chickweed	FAC		1.6
Smilax bona-nox	Saw greenbrier	-		0.9
Parthenocissus quinquefolia	Virginia creeper	-		0.6
Persea borbonia	Red bay	UPL		0.6
Commelina diffusa	Dayflower	FACW	ǂ	0.5
Callicarpa americana	American beauty-berry	UPL		0.3
Desmodium incanum	Zarzabacao comun	UPL	ǂ	0.3
Oxalis corniculata	Yellow wood sorrel	UPL	ǂ	0.3
Quercus laurifolia	Laurel oak	FACW		0.3
Quercus nigra	Water oak	UPL		0.3
Total Cover of Species Listed in Tables			**(3)**	**17.6**
Species Not Listed in Tables				
Dichanthelium acuminatum	Panic grass	FACW	ǂ	3.1
Osmunda cinnamomea	Cinnamon fern	FACW		3.1
Andropogon glomeratus	Bushy bluestem	FACW	ǂ	2.5
Ilex glabra	Gallberry	UPL		0.6
Panicum rigidulum	Red-top panic grass	FACW	ǂ	0.6
Setaria parviflora	Knotroot bristle grass	FAC	ǂ	0.6
Vicia acutifolia	Four-leaf vetch	FACW		0.3
Total Cover of Species Not Listed in Tables			**(4)**	**10.8**
Non-Native Species				
Pouzolzia zeylanica	Pouzolz's bush	FAC		0.3
Sporobolus indicus	Smutgrass	UPL		0.3
Total Cover of Non-Native Species			**(0)**	**0.6**
Nuisance Species				
Urena lobata	Caesarweed	UPL	ǂ	11.9
Paspalum notatum	Bahia grass	UPL	ǂ	1.9
Cynodon dactylon	Bermuda grass	UPL	ǂ	1.3
Imperata cylindrica	Cogon grass	UPL	ǂ	0.6
Total Cover of Nuisance Species			**(4)**	**15.7**
Total Species Cover			**11**	**44.7**
Total Bare Ground/Dead Litter				**55.4**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 89: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Desirable Species Listed in Tables[1]			
Acer rubrum	Red maple		FACW
Cyperus croceus	Baldwin flatsedge	ǂ	FAC
Digitaria ciliaris	Southern crabgrass	ǂ	UPL
Erechtites hieraciifolius	Fireweed		FAC
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Liquidambar styraciflua	Sweetgum		FACW
Pinus elliottii	Slash pine		UPL
Rubus argutus	Sawtooth blackberry		FAC
Scoparia dulcis	Licorice weed	ǂ	FAC
Smilax auriculata	Earleaf greenbriar		-
Solidago fistulosa	Pine-barren goldenrod		FACW
Tillandsia usneoides	Spanish moss		UPL
Toxicodendron radicans	Poison ivy		-
Species Not Listed in Tables			
Acrostichum danaeifolium	Giant leather fern		OBL
Cyperus compressus	Poorland flatsedge	ǂ	FACW
Cyperus haspan	Haspan flatsedge	ǂ	OBL
Cyperus strigosus	Straw colored flatsedge	ǂ	FACW
Cyperus surinamensis	Tropical flatsedge	ǂ	FACW
Eriocaulon decangulare	Ten-angle pipewort		OBL
Helianthus angustifolius	Narrowleaf sunflower	ǂ	FACW
Juncus marginatus	Grassleaf rush	ǂ	FACW
Ludwigia maritima	Seaside primrosewillow		FACW
Ludwigia octovalvis	Large seedbox	ǂ	OBL
Luziola fluitans	Southern watergrass		OBL
Lycopodiella cernua	Nodding clubmoss		FACW
Nephrolepis exaltata	Boston fern		FAC
Osmunda regalis	Royal fern		OBL
Panicum dichotomiflorum	Fall panicum	ǂ	FACW
Polygonum punctatum	Dotted smartweed	ǂ	OBL
Pontederia cordata	Pickerelweed	ǂ	OBL
Rhynchospora fascicularis	Fasciculate beakrush	ǂ	FACW
Sagittaria lancifolia	Bulltongue arrowhead		OBL
Saururus cernuus	Lizard's tail		OBL
Solidago sempervirens	Seaside goldenrod		FACW
Woodwardia areolata	Netted chain fern		OBL
Woodwardia virginica	Virginia chain fern		FACW

TABLE 89: ADDITIONAL SPECIES - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Non-Native Species			
Ceratopteris thalictroides	Watersprite		OBL
Crotalaria pallida	Smooth rattle-box	ǂ	UPL
Kyllinga brevifolia	Shortleaf spikesedge	ǂ	FACW
Lindernia crustacea	Malaysian false pimpernel	ǂ	FAC
Phyllanthus urinaria	Chamberbitter	ǂ	FAC
Nuisance Species			
Ludwigia peruviana	Primrose willow	ǂ	OBL
Lygodium japonicum	Japanese climbing fern		-
Paederia foetida	Skunkvine	ǂ	UPL
Praxelis clematidea	Praxelis		UPL
Total Additional Desirable Species Listed in Tables		**3**	**13**
Total Additional Species Not Listed in Tables		**11**	**23**
Total Additional Non-Native Species		**4**	**5**
Total Additional Nuisance Species		**2**	**4**
Total Additional Species		**20**	**45**

(1) Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

(2) FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 90: TREE DENSITY BY SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	SEEDLING
			LIVE	STRESSED				
Tree Species Listed in Table(1)								
Quercus geminata	Sand live oak	UPL	8	0	8	80	100.0	0
TOTAL			**8**	**0**	**8**	**80**	**100.0**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table(1)						
Serenoa repens	Saw palmetto	UPL	46	0	46	460
Rhus copallinum	Winged sumac	UPL	9	0	9	90
TOTAL			**55**	**0**	**55**	**550**

(1) Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

(1) Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 91: HERBACEOUS COVER BY SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Andropogon virginicus	Broomsedge	FAC	ǂ	6.1
Cyperus retrorsus	Pinebarren flatsedge	FAC	ǂ	4.7
Pityopsis graminifolia	Narrowleaf silkgrass	UPL	ǂ	4.2
Eupatorium capillifolium	Dogfennel	FAC		1.1
Eragrostis elliottii	Elliot's lovegrass	FAC		0.9
Paspalum setaceum	Thin paspalum	FAC	ǂ	0.8
Crotalaria rotundifolia	Rabbitbells	UPL	ǂ	0.7
Smilax auriculata	Earleaf greenbriar	-		0.6
Rhus copallinum	Winged sumac	UPL		0.3
Total Cover of Species Listed in Tables			**(5)**	**19.4**
Species Not Listed in Tables				
Polypremum procumbens	Rustweed	FAC	ǂ	6.4
Euthamia caroliniana	Slender goldenrod	FAC		4.5
Scoparia dulcis	Licorice weed	FAC	ǂ	3.2
Conyza canadensis	Dwarf horseweed	UPL	ǂ	2.5
Dichanthelium acuminatum	Panic grass	FACW	ǂ	0.6
Hypericum tetrapetalum	St. John's wort	FAC	ǂ	0.6
Ludwigia maritima	Seaside primrosewillow	FACW	ǂ	0.3
Ludwigia octovalvis	Large seedbox	OBL	ǂ	0.3
Smilax bona-nox	Saw greenbrier	-		0.3
Total Cover of Species Not Listed in Tables			**(7)**	**18.7**
Non-Native Species				
Crotalaria pallida	Smooth rattle-box	UPL	ǂ	3.7
Abutilon theophrasti	Velvetleaf	UPL	ǂ	1.4
Gamochaeta pensylvanica	Pennsylvania everlasting	UPL		0.9
Indigofera hirsuta	Hairy indigo	UPL	ǂ	0.3
Phyllanthus urinaria	Chamberbitter	FAC	ǂ	0.3
Total Cover of Non-Native Species			**(4)**	**6.6**
Nuisance Species[2]				
Paspalum notatum	Bahia grass	UPL	ǂ	30.3
Melinis repens	Natalgrass	UPL	ǂ	10.5
Urena lobata	Caesarweed	UPL		1.3
Praxelis clematidea	Praxelis	UPL	ǂ	0.6
Total Cover of Nuisance Species			**(3)**	**42.7**
Total Species Cover			**19**	**87.4**
Total Bare Ground/Dead Litter				**12.6**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 92: ADDITIONAL SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables(1)			
Andropogon ternarius	Splitbeard bluestem	ǂ	UPL
Aristida stricta	Wiregrass		FAC
Asimina obovata	Bigflower pawpaw		-
Buchnera americana	American bluehearts	ǂ	UPL
Callicarpa americana	American beauty-berry	ǂ	UPL
Croton michauxii	Rushfoil	ǂ	UPL
Cyperus croceus	Baldwin flatsedge	ǂ	FAC
Eupatorium mohrii	Eupatorium		FAC
Galactia elliotii	Milkpea		UPL
Lechea deckertii	Deckert's pinweed		-
Opuntia humifusa	Pricklypear		UPL
Piloblephis rigida	Wild pennyroyal	ǂ	UPL
Rhynchospora microcarpa	Southern beakrush	ǂ	OBL
Vaccinium myrsinites	Shiny blueberry	ǂ	UPL
Vitis rotundifolia	Muscadine grape		-
Licania michauxii	Gopher apple		UPL
Species Not Listed in Tables			
Aeschynomene americana	Meadow joint-vetch	ǂ	UPL
Andropogon glomeratus	Bushy bluestem	ǂ	FACW
Aristida spiciformis	Pinebarren three-awn		FAC
Chamaecrista nictitans	Wild sensitive plant		UPL
Coreopsis leavenworthii	Leavenworth's tickseed	ǂ	FACW
Cyperus virens	Green flatsedge	ǂ	FACW
Erechtites hieraciifolius	Fireweed	ǂ	FAC
Eupatorium mohrii	Eupatorium	ǂ	FAC
Helianthemum corymbosum	Pinebarren frostweed	ǂ	UPL
Hydrocotyle umbellata	Manyflower marshpennywort		FACW
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Hyptis alata	Musky mint	ǂ	FACW
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Lepidium virginicum	Pepper grass	ǂ	UPL
Muhlenbergia capillaris	Gulf muhly grass	ǂ	OBL
Panicum rigidulum	Red-top panic grass	ǂ	FACW
Portulaca pilosa	Pink purslane	ǂ	UPL
Pterocaulon pycnostachyum	Blackroot		UPL
Rubus argutus	Sawtooth blackberry		FAC
Sabatia brevifolia	Shortleaf rosegentian	ǂ	FACW
Sesbania herbacea	Danglepod	ǂ	FAC
Setaria parviflora	Knotroot bristle grass	ǂ	FAC
Solidago fistulosa	Pine-barren goldenrod	ǂ	FACW

TABLE 92: ADDITIONAL SPECIES - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Not Listed in Tables (Continued)			
Syngonanthus flavidulus	Bantam-buttons		FACW
Tillandsia usneoides	Spanish moss		UPL
Vaccinium corymbosum	Highbush blueberry	ǂ	FACW
Vicia acutifolia	Four-leaf vetch		FACW
Viola sororia	Common blue violet	ǂ	FACW
Woodwardia virginica	Virginia chain fern		FACW
Xyris sp.	Yellow-eyed grass	ǂ	OBL
Non-Native Species			
Alysicarpus ovalifolius	False moneywort	ǂ	UPL
Bulbostylis barbata	Watergrass	ǂ	UPL
Desmodium incanum	Zarzabacao comun	ǂ	UPL
Desmodium triflorum	Beggarweed	ǂ	UPL
Richardia brasiliensis	Richardia	ǂ	UPL
Sacciolepis indica	Glenwood grass	ǂ	FAC
Sporobolus indicus	Smutgrass	ǂ	UPL
Nuisance Species[2]			
Macroptilium lathyroides	Phaseolus	ǂ	-
Total Additional Species Listed in Tables		**8**	**16**
Total Additional Species Not Listed in Tables		**21**	**30**
Total Additional Non-Native Species		**7**	**7**
Total Additional Nuisance Species		**1**	**1**
Total Additional Species		**37**	**54**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 93: TREE DENSITY BY SPECIES - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	SEEDLING
			LIVE	STRESSED				
Tree Species Listed in Table[1]								
Quercus geminata	Sand live oak	UPL	43	0	43	573	97.7	20
Tree Species Listed In Table Subtotals			**43**	**0**	**43**	**573**	**97.7**	**20**
Tree Species Not Listed in Table								
Quercus virginiana	Live oak	UPL	1	0	1	13	2.3	0
Tree Species Not Listed in Table Subtotals			**1**	**0**	**1**	**13**	**2.3**	**0**
TOTALS			**44**	**0**	**44**	**586**	**100.0**	**20**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[1]						
Serenoa repens	Saw palmetto	UPL	23	0	23	307
TOTAL			**23**	**0**	**23**	**307**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[1] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 94: HERBACEOUS COVER BY SPECIES - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Quercus geminata	Sand live oak	UPL		5.0
Smilax auriculata	Earleaf greenbriar	-		2.5
Paspalum setaceum	Thin paspalum	FAC	ǂ	2.4
Vaccinium myrsinites	Shiny blueberry	UPL		1.4
Andropogon virginicus	Broomsedge	FAC	ǂ	1.3
Solidago odorata var. chapmanii	Chapman's goldenrod	UPL		1.3
Eragrostis elliottii	Elliot's lovegrass	FAC	ǂ	1.2
Aristida stricta	Wiregrass	FAC		0.8
Eupatorium capillifolium	Dogfennel	FAC		0.4
Yucca filamentosa	Adam's needle	UPL		0.3
Total Cover of Species Listed in Tables			**(3)**	**16.6**
Species Not Listed in Tables				
Panicum rigidulum	Red-top panic grass	FACW	ǂ	6.3
Dichanthelium acuminatum	Panic grass	FACW	ǂ	5.5
Smilax bona-nox	Saw greenbrier	-		1.1
Scoparia dulcis	Licorice weed	FAC	ǂ	0.4
Total Cover of Species Not Listed in Tables			**(3)**	**13.3**
Non-Native Species				
Lindernia crustacea	Malaysian false pimpernel	FAC	ǂ	1.0
Total Cover of Non-Native Species			**(1)**	**1.0**
Nuisance Species[2]				
Urena lobata	Caesarweed	UPL	ǂ	3.2
Paspalum notatum	Bahia grass	UPL	ǂ	0.8
Total Cover of Nuisance Species			**(2)**	**4.0**
Total Species Cover			**9**	**34.9**
Total Bare Ground/Dead Litter				**65.2**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 95: ADDITIONAL SPECIES - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Asimina obovata	Bigflower pawpaw		-
Croton michauxii	Rushfoil	ǂ	UPL
Cyperus croceus	Baldwin flatsedge	ǂ	FAC
Cyperus retrorsus	Pinebarren flatsedge	ǂ	FAC
Eupatorium mohrii	Eupatorium		FAC
Erucastrum gallicum	Common dogmustard		UPL
Galactia elliotii	Milkpea		UPL
Opuntia humifusa	Pricklypear		UPL
Piloblephis rigida	Wild pennyroyal	ǂ	UPL
Pityopsis graminifolia	Narrowleaf silkgrass	ǂ	UPL
Rhus copallinum	Winged sumac		UPL
Vitis rotundifolia	Muscadine grape		-
Species Not Listed in Tables			
Aristida spiciformis	Pinebarren three-awn		FAC
Euthamia caroliniana	Slender goldenrod		FAC
Fimbristylis dichotoma	Forked fimbry		OBL
Helianthemum corymbosum	Pinebarren frostweed	ǂ	UPL
Hypericum tetrapetalum	St. John's wort	ǂ	FAC
Lachnocaulon anceps	White-head bogbutton	ǂ	FACW
Polypremum procumbens	Rustweed	ǂ	FAC
Pterocaulon pycnostachyum	Blackroot		UPL
Quercus pumila	Running oak		UPL
Sabatia brevifolia	Shortleaf rosegentian	ǂ	FACW
Total Additional Species Listed in Tables		**5**	**12**
Total Additional Species Not Listed in Tables		**5**	**10**
Total Additional Species		**10**	**22**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 96: TREE DENSITY BY SPECIES - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

TREES

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (trees/acre)	PERCENT OF TOTAL	SEEDLING
			LIVE	STRESSED				
Tree Species Listed in Table[1]								
Quercus geminata	Sand live oak	UPL	14	0	14	187	77.8	0
Tree Species Listed In Table Subtotals			**14**	**0**	**14**	**187**	**77.8**	**0**
Tree Species Not Listed in Table								
Quercus nigra	Water oak	UPL	2	0	2	27	11.1	0
Sabal palmetto	Cabbage palm	FAC	2	0	2	27	11.1	0
Tree Species Not Listed in Table Subtotals			**4**	**0**	**4**	**54**	**22.2**	**0**
TOTALS			**18**	**0**	**18**	**241**	**100.0**	**0**

SHRUBS

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	CONDITION		TOTAL	DENSITY (shrubs/acre)
			LIVE	STRESSED		
Shrub Species Listed in Table[1]						
Serenoa repens	Saw palmetto	UPL	36	0	36	480
Callicarpa americana	American beauty-berry	UPL	3	0	3	40
TOTAL			**39**	**0**	**39**	**520**

[1] Tree species listed in Table 2 of the Hillsborough County Phosphate Mining Reclamation Manual

[1] Shrub species listed in Table 3 of the Hillsborough County Phosphate Mining Reclamation Manual

TABLE 97: HERBACEOUS COVER BY SPECIES - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	Ch. 62-340, F.A.C. STATUS	FRUIT OR FLOWER	TOTAL PERCENT COVER
Species Listed in Tables[1]				
Serenoa repens	Saw palmetto	UPL		9.3
Aristida stricta	Wiregrass	FAC		8.8
Vaccinium myrsinites	Shiny blueberry	UPL		3.0
Gratiola hispida	Rough hedgehyssop	FAC	ǂ	1.3
Andropogon sp.	Broomsedge	-	ǂ	1.2
Solidago odorata var. chapmanii	Chapman's goldenrod	UPL	ǂ	1.1
Smilax auriculata	Earleaf greenbriar	-		0.8
Carphephorus corymbosus	Florida paintbrush	UPL	ǂ	0.4
Liatris gracilis	Slender goldenrod	FAC	ǂ	0.3
Total Cover of Species Listed in Tables			**(5)**	**26.2**
Species Not Listed in Tables				
Euthamia caroliniana	Slender goldenrod	FAC		2.8
Pteridium aquilinum	Bracken fern	UPL		2.1
Pterocaulon pycnostachyum	Blackroot	UPL		0.4
Ludwigia maritima	Seaside primrosewillow	FACW		0.3
Total Cover of Species Not Listed in Tables			**(0)**	**5.6**
Nuisance Species[2]				
Urena lobata	Caesarweed	UPL	ǂ	0.4
Total Cover of Nuisance Species			**(1)**	**0.4**
Total Species Cover			**6**	**32.2**
Total Bare Ground/Dead Litter				**67.8**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 98: ADDITIONAL SPECIES - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
OCTOBER - NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	Ch. 62-340, F.A.C. STATUS
Species Listed in Tables[1]			
Andropogon virginicus	Broomsedge	ǂ	FAC
Croton michauxii	Rushfoil	ǂ	UPL
Cyperus retrorsus	Pinebarren flatsedge	ǂ	FAC
Eragrostis elliottii	Elliot's lovegrass		FAC
Erucastrum gallicum	Common dogmustard	ǂ	UPL
Eupatorium capillifolium	Dogfennel		FAC
Euphorbia polyphylla	Lesser florida spurge		FACW
Lechea deckertii	Deckert's pinweed		-
Quercus laevis	Turkey oak		UPL
Rhus copallinum	Winged sumac		UPL
Tripsacum dactyloides	Fakahatchee grass	ǂ	FAC
Vitis rotundifolia	Muscadine grape		-
Yucca filamentosa	Adam's needle		UPL
Species Not Listed in Tables			
Aristida spiciformis	Pinebarren three-awn		FAC
Cenchrus gracillimus	Slender sandbur	ǂ	UPL
Chasmanthium laxum	Slender spikegrass	ǂ	FACW
Hieracium gronovii	Queen-devil		UPL
Dichanthelium acuminatum	Panic grass		FACW
Eupatorium mohrii	Eupatorium	ǂ	FAC
Helianthemum corymbosum	Pinebarren frostweed	ǂ	UPL
Hypericum cistifolium	Round-pod St. John's wort	ǂ	FACW
Hypoxis juncea	Yellow star grass	ǂ	FACW
Hypericum tetrapetalum	St. John's wort	ǂ	FAC
Lepidium virginicum	Pepper grass		UPL
Oenothera laciniata	Cutleaf evening primrose		UPL
Persea borbonia	Red bay		UPL
Polygala lutea	Orange milkwort	ǂ	FACW
Polypremum procumbens	Rustweed	ǂ	FAC
Quercus laurifolia	Laurel oak		FACW
Quercus pumila	Running oak		UPL
Smilax bona-nox	Saw greenbrier		-
Syngonanthus flavidulus	Bantam-buttons		FACW
Utricularia subulata	Bladderwort	ǂ	OBL
Vaccinium corymbosum	Highbush blueberry		FACW
Non-Native Species			
Bulbostylis barbata	Watergrass	ǂ	UPL
Nuisance Species[2]			
Imperata cylindrica	Cogon grass		UPL
Total Additional Species Listed in Tables		**5**	**13**
Total Additional Species Not Listed in Tables		**10**	**21**
Total Additional Non-Native Species		**1**	**1**
Total Additional Nuisance Species		**0**	**1**
Total Additional Species		**16**	**36**

[1] Species listed in Tables 2, 3, and 4 of the Hillsborough County Phosphate Mining Reclamation Manual

[2] FISC (2023) Category 1 and 2 nuisance species and species listed in the HCPMRM Subsection C.1.

ǂ Observation of fruit or flowering body

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X									X				X			
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X	X										X				
Andropogon virginicus	Broomsedge	X	X		X	X	X		X	X	X	X					X	
Aristida stricta	Wiregrass		X											X				
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X											X				
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X	X		X												
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X												X				
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X												X				
Commelina gambiae	Gambian dayflower	X								X					X	X		
Conyza canadensis	Dwarf horseweed	X								X	X			X				
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X				X											
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X								X	X						X	
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X	X	X	X	X											
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X	X			X											
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X		X														
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X	X														
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass			X														
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X												X				
Eragrostis elliottii	Elliot's lovegrass	X	X	X												X		
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X				X								X			
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X										X				
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X		X														

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X	X			X											
Gamochaeta pensylvanica	Pennsylvania everlasting		X	X		X												
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X											X	X		X	
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		X					X					X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X				X											
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X											X				
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X		X	X										X	X		
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X						X					X		X	X	
Ludwigia octovalvis	Large seedbox	X			X													
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass																	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X	X														
Panicum repens	Torpedo grass	X		X														
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass					X												
Paspalum setaceum	Thin paspalum	X	X	X	X	X												
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X	X														
Phyllanthus urinaria	Chamberbitter	X		X										X				
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X			X	X	X		X							X		
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X						X					X				
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X														X	
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X												X				
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X	X	X				X					X		X		
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X				X											
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X	X										X				
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X						X					X				
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X			X									X				
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X						X	X	X		X				

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X												**X**				
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X		X					X						X		X	
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X						X							X		
Andropogon virginicus	Broomsedge	X	X	X														
Aristida stricta	Wiregrass		X	X		X	X											
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X		X														
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite										X							
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X							X	X					X			
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X			X		X											
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X								X								
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X							X									
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X							X								
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X							X									
Eragrostis elliottii	Elliot's lovegrass	X	X		X													
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X						X		X	X			X	X		
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X														
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Froelichia floridana	Cottonweed	X	X		X													
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X						X	X	X							
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles													X				
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		X														
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X										X						
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X									X	X						
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus													X				
Melinis repens	Natalgrass				X		X		X									
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X							X									
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X	X														
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X											X	X	X	X	
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X							X	X	X	X						
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem			X	X	X												
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X						X	X		X						
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod										X							
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X											X			X	
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X		X	X			X	X	X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X							X						X			
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X							X					X				
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X						X					X	X		X	
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X	X														
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X		X										X				
Conyza canadensis	Dwarf horseweed	X		X	X	X	X											
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X											X				
Crotalaria pallida	Smooth rattle-box	X		X			X											
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X												X			
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X										X				X		
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X						X									
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X			X								X		X	X	
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X			X			X					X				
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X													X		
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed			X														
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X												X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X							X						X	X		
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X											X				
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass				X		X				X			X				
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X											X				
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X						X		X							
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X												X				
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X		X														
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem													X				
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X		X					X	X			X				
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X							X		X						
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X												X	X	X	X	
Sporobolus indicus	Smutgrass	X		X	X	X	X									X		
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X					X		X	X						

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add	T21-QN	T21-QS	T21-QE	T21-QW	T21-Add	T22-QN	T22-QS	T22-QE	T22-QW	T22-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X			X				X	X	X	X						
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X				X		X									
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X							X									
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						X									
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X	X														
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X			X													
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X											X	X	X	X	
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X											X				
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X	X		X			X	X	X	X						
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X						X									
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X				**X**											
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X	**X**														
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X							**X**					**X**				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X				**X**												
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass													X		X		
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X	X														
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		X			X											
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X	X														
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X	X	X	X	X				X							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X			X												
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X												X				
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X	X		X		X					X	X	X	X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T23-QN	T23-QS	T23-QE	T23-QW	T23-Add	T24-QN	T24-QS	T24-QE	T24-QW	T24-Add	T25-QN	T25-QS	T25-QE	T25-QW	T25-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X				X								X	X	X		
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X		X		X												
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X											X	X	X	X	
Aristida stricta	Wiregrass		X								X							
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X		X	X													
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X						X									
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X						X									
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X		X	X	X	X											
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X							X									
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed					**X**												
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X											**X**				
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X							**X**	**X**			**X**	**X**	**X**	**X**	
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X											**X**				
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X											**X**				
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X	X	X	X												
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed								X	X	X	X						
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X												X				
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X							X		X	X		X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X											X				
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X		X														
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass								X	X	X	X		X		X	X	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X				X											
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X					X											
Portulaca pilosa	Pink purslane			X														
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia					**X**	**X**											
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem								**X**		**X**	**X**						
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X		**X**													
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X		**X**	**X**	**X**	**X**											
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T26-QN	T26-QS	T26-QE	T26-QW	T26-Add	T27-QN	T27-QS	T27-QE	T27-QW	T27-Add	T28-QN	T28-QS	T28-QE	T28-QW	T28-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X												X				
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X											X			X	
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X											X				
Andropogon virginicus	Broomsedge	X	X						X		X	X		X	X	X		
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X											X				
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X			X													
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X												X	X	X		
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X											X				
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X	X														
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X	X														
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X												X				
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X		X													
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X											X				
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X	X														
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X								X	X			X			
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X											X				
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X		X													
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X				X									X	X	
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X												X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X					X											
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass									X				X				
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass								X			X						
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X		X														
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X					X									X		
Phytolacca americana	Common pokeweed	X								X								
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X										X				X		
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X												X				
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X			**X**		**X**											
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X								**X**							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod						**X**											
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X	**X**		**X**												
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X											**X**				
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X												**X**	**X**	**X**	**X**	
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		**X**	**X**	**X**	**X**			**X**				**X**				

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T29-QN	T29-QS	T29-QE	T29-QW	T29-Add	T30-QN	T30-QS	T30-QE	T30-QW	T30-Add	T31-QN	T31-QS	T31-QE	T31-QW	T31-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X												X			X	
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X							X				X				
Andropogon virginicus	Broomsedge	X	X						X	X	X				X			
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X						X									
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X							X									
Cirsium nuttallii	Nuttall's thistle	X							X									
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X												X				
Conyza canadensis	Dwarf horseweed	X												X				
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X							X									
Crotalaria rotundifolia	Rabbitbells	X	X				X											
Crotalaria spectabilis	Rattle-box	X												X				
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X	X							X			X				
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X								X	X			X			X	
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X						X									
Desmodium triflorum	Beggarweed													X				
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass			X														
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X									X		X				
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X						X									
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X							X					X	X	X	
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X	X	X						X		X				
Fimbristylis autumnalis	Fringe-rush		X												X			
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X							X	X							
Helianthemum corymbosum	Pinebarren frostweed	X	X		X	X	X											
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X						X						X		X	
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X							X					X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed			X														
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X		X					X		X	X				X		
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X													X		
Ludwigia octovalvis	Large seedbox	X							X									
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus													X				
Melinis repens	Natalgrass				X	X			X	X	X	X						
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X												X		X		
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern			X														
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X		X	X												
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X	X					X									
Panicum repens	Torpedo grass	X							X									
Panicum rigidulum	Red-top panic grass	X		X														
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass													X				
Paspalum setaceum	Thin paspalum	X	X	X														
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X						X					X				
Phyllanthus urinaria	Chamberbitter	X							X						X			
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X			X		X		X		X				X			
Portulaca pilosa	Pink purslane			X														
Praxelis clematidea	Praxelis	X									X							
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry			X	X		X											
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X	X					X					X		X		
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod													X				
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X							X								
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X	X														
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X							X					X				
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X	X														
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X					X		X					X				

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T32-QN	T32-QS	T32-QE	T32-QW	T32-Add	T33-QN	T33-QS	T33-QE	T33-QW	T33-Add	T34-QN	T34-QS	T34-QE	T34-QW	T34-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X																
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X							X									
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X						X									
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X							X	X	X						
Andropogon virginicus	Broomsedge	X	X	X										X				
Aristida stricta	Wiregrass		X				X											
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X						X									
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X		X										X		X		
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X											X	X	X	X	
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X			X		X					X						
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						X									
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X						X									
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X	X	X	X					X				X	X		
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X	X								X						
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X							X	X			X				
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed			X	X	X	X							X			X	
Hydrocotyle umbellata	Manyflower marshpennywort		X							X								
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X		X														
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X				X								X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X		X														
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass			X	X	X	X		XX		X	X		X	X	X	X	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X	X														
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		X														
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem			X										X	X			
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X															
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X							X								
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X							X									
Sporobolus indicus	Smutgrass	X																
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T35-QN	T35-QS	T35-QE	T35-QW	T35-Add	T36-QN	T36-QS	T36-QE	T36-QW	T36-Add	T37-QN	T37-QS	T37-QE	T37-QW	T37-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X							X									
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X											X	X	X	X	
Andropogon virginicus	Broomsedge	X	X				X		X									
Aristida stricta	Wiregrass		X	X														
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X												X	X		
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X													X			
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X				X												
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X			X	X											
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X												X				
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed			**X**														
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X	**X**												**X**		
Eragrostis spectabilis	Purple lovegrass		X						**X**	**X**		**X**						
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Froelichia floridana	Cottonweed	X	X	**X**														
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed				**X**		**X**											
Hydrocotyle umbellata	Manyflower marshpennywort		X											**X**				
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X											**X**				
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		**X**					**X**									
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X							**X**									
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X												**X**				
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X												X	X		X	
Macroptilium lathyroides	Phaseolus													X				
Melinis repens	Natalgrass			X	X	X	X		X	X	X	X						
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine													X			X	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X											X				
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X												X				
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X												X				
Phyla nodiflora	Frog-fruit	X	X											X				
Phyllanthus urinaria	Chamberbitter	X												X				
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X											X				
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia				X													
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem			X			X											
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X											X				
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod													X			X	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X											X			X	
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X												X	X	X	
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod														X			
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X														X	X	
Sporobolus indicus	Smutgrass	X							X	X	X	X						
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X												X			X	
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X												X				

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T38-QN	T38-QS	T38-QE	T38-QW	T38-Add	T39-QN	T39-QS	T39-QE	T39-QW	T39-Add	T40-QN	T40-QS	T40-QE	T40-QW	T40-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Abutilon theophrasti	Velvetleaf	X												X				
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X			X				X	X	X			X	X	X	X	
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X	X														
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X						X	X		X						
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X								X		X						
Conyza canadensis	Dwarf horseweed	X			X		X											
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X		X			X							X	X	X	X	
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X							X		X							
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Cynodon dactylon	Bermuda grass			X			X											
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X	X														
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X						X			X						
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X							X	X							
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		**X**	**X**	**X**					**X**			**X**				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass			X	X									X	X	X	X	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X								X		X						
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X			X		X											
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem													X				
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X								X							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X	X														
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X		X	X	X	X											
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X											X			

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T41-QN	T41-QS	T41-QE	T41-QW	T41-Add	T42-QN	T42-QS	T42-QE	T42-QW	T42-Add	T43-QN	T43-QS	T43-QE	T43-QW	T43-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X			X						X							
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X										X						
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X						X									
Andropogon virginicus	Broomsedge	X	X	X					X			X				X		
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X						X			X						
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X										X						
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X							X	X		X			X			
Conyza canadensis	Dwarf horseweed	X							X	X	X	X						
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						X									
Crotalaria pallida	Smooth rattle-box	X							X			X						
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X											X				
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X					X					X						
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X	X														
Desmodium triflorum	Beggarweed				X					X								
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X						X	X								
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X			X													
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X	X														
Erigeron quercifolius	Oak-leaf fleabane	X	X									X						
Eupatorium capillifolium	Dogfennel		X								X	X		X				
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X									X		X				
Fimbristylis autumnalis	Fringe-rush		X											X	X			
Fimbristylis dichotoma	Forked fimbry	X			X	X	X								X	X		

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X	X	X		X											
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X							X			X		X				
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X							X			X						
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X						X									
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X		X	X	X	X							X				
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X											X	X			
Ludwigia octovalvis	Large seedbox	X				X												
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass													X				
Melochia corchorifolia	Chocolate-weed	X		X														
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X	X														
Paspalum urvillei	Vaseygrass	X												X				
Phyla nodiflora	Frog-fruit	X	X	X														
Phyllanthus urinaria	Chamberbitter	X		X					X	X	X	X						
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		X		X								X				
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X											X				
Richardia brasiliensis	Richardia										X							
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X											X				
Scoparia dulcis	Licorice weed	X	X	X	X	X					X							
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod															X	X	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X													X		
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X				X	X		X							X		
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X					X	X		X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T44-QN	T44-QS	T44-QE	T44-QW	T44-Add	T45-QN	T45-QS	T45-QE	T45-QW	T45-Add	T46-QN	T46-QS	T46-QE	T46-QW	T46-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Abutilon theophrasti	Velvetleaf	X										X					X	
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X		X	X	X	X					X						
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X	X														
Andropogon virginicus	Broomsedge	X	X				X			X								
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X									X							
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X		X													
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X										X						
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X		X														
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X		X														
Commelina gambiae	Gambian dayflower	X		X														
Conyza canadensis	Dwarf horseweed	X		X														
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X												X		X		
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X				X												

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X						X									
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X		X														
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed			X					X									
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X	X														
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X		X														
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X	X														
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X							X								
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X											X			X	
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X		X													
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		X						X				X			X	
Ipomoea aquatica	Water morning glory								X									
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X										X						
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X		X	X												
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass								X					X	X	X	X	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine			X														
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X								X							
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass					X				X		X						
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		X														
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X			X													
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X		X													
Polypremum procumbens	Rustweed	X		X										X				
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X												X	X	X	X	
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia								X									
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X		X														
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X	X					X		X	X		X			X	
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod			X														
Sesbania vesicaria	Bladderpod			X														
Setaria parviflora	Knotroot bristle grass	X	X	X														
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple			X														
Solidago fistulosa	Pine-barren goldenrod		X	X														
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X					X		X									
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X			X				X								X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T47-QN	T47-QS	T47-QE	T47-QW	T47-Add	T48-QN	T48-QS	T48-QE	T48-QW	T48-Add	T49-QN	T49-QS	T49-QE	T49-QW	T49-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Abutilon theophrasti	Velvetleaf	X		X														
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X				X												
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X		X										X				
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X									X		X			X	
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X						X	X								
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X				X												
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X		X							X							
Conyza canadensis	Dwarf horseweed	X		X														
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Cynodon dactylon	Bermuda grass								X									
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X							X		X						
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed														X		X	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X											X				
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X						X							X		
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X											X				
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X													**X**			
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X										**X**					**X**	
Ipomoea aquatica	Water morning glory								**X**	**X**		**X**						
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X													**X**		
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass			X	X	X	X		X		X			X	X	X	X	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X														X		
Panicum hemitomon	Maidencane	X	X						X									
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X								X				X				
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X		X														
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia											X						
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X	X												X	X	
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X							X	X								
Sporobolus indicus	Smutgrass	X							X							X		
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T50-QN	T50-QS	T50-QE	T50-QW	T50-Add	T51-QN	T51-QS	T51-QE	T51-QW	T51-Add	T52-QN	T52-QS	T52-QE	T52-QW	T52-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Abutilon theophrasti	Velvetleaf	X												X				
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X														X	X	
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X	X					X	X		X		X				
Aristida stricta	Wiregrass		X						X									
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X		X		X			X	X				X				
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge								X									
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																X	
Chamaecrista nictitans	Wild sensitive plant		X	X														
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X												X				
Commelina gambiae	Gambian dayflower	X												X				
Conyza canadensis	Dwarf horseweed	X												X				
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X	X											X	X		
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X						X					X				
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X													X			
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X						X									
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X						X									
Eragrostis spectabilis	Purple lovegrass		X							X	X							
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X							X								
Eupatorium capillifolium	Dogfennel		X															
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X								X							
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X						X	X		X						
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed			X														
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		X								X		X				
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X							X					X	X	X		
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X												X	X		
Ludwigia octovalvis	Large seedbox	X															X	
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass			X	X	X	X		X					X				
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X							X								
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X									X							
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X						X			X		X	X	X		
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X															
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X													X			
Sporobolus indicus	Smutgrass	X									X			X			X	
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X					X				

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T53-QN	T53-QS	T53-QE	T53-QW	T53-Add	T54-QN	T54-QS	T54-QE	T54-QW	T54-Add	T55-QN	T55-QS	T55-QE	T55-QW	T55-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X							X	X	X	X						
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X												X				
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X											X	X	X	X	
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern													X				
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X																
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X															X	
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X															X	
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed													X				
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X													X	X		
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X	X														
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X			X					X				X			
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X											X	X	X		
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X												X				
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		X														
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X												X		X	X	
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass			X	X	X	X		X									
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine															X	X	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X							X								
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern													X				
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X						X									
Phyllanthus urinaria	Chamberbitter	X							X									
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X												X			
Polypremum procumbens	Rustweed	X								X		X						
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X													X			
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem				X													
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X	X					X		X	X						
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X													X		
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X														X	
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X		X			X		X									
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X												X	X		X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T56-QN	T56-QS	T56-QE	T56-QW	T56-Add	T57-QN	T57-QS	T57-QE	T57-QW	T57-Add	T58-QN	T58-QS	T58-QE	T58-QW	T58-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern													X				
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X													X	X	X	
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X													X		X	
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X						X									
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X				X		X									
Andropogon virginicus	Broomsedge	X	X		X	X			X	X								
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X														X		
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X			X									X		X		
Conyza canadensis	Dwarf horseweed	X							X			X						
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X							X									
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Cynodon dactylon	Bermuda grass			X														
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed													X				
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X							X	X							
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X	X	X													
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X														
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X	X														
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X		X					X									
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X							X		X							
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X			X												
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X							X	X	X							
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X														X	
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass								X		X	X						
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X		X														
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X												X			X	
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X	X														
Polypremum procumbens	Rustweed	X								X				X	X			
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X							X	X		X						
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia								X					X				
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X							X				X		X		
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X	X					X									
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X	X														
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X							X	X		X		X	X	X		
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							X					X				

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T59-QN	T59-QS	T59-QE	T59-QW	T59-Add	T60-QN	T60-QS	T60-QE	T60-QW	T60-Add	T61-QN	T61-QS	T61-QE	T61-QW	T61-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X																
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X	X	X	X						X						
Andropogon virginicus	Broomsedge	X	X		X									X				
Aristida stricta	Wiregrass		X															
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X							X		X						
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X					X											
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X		X								X						
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X		X														
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X	X														
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass														X			
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X			X												
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X	X		X	X			X	X							
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X	X														
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X	X										X	X	X	X	
Fimbristylis autumnalis	Fringe-rush		X															
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X	X					X									
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X							X									
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X																
Ipomoea aquatica	Water morning glory																	
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X	X														
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X											X				
Lindernia crustacea	Malaysian false pimpernel	X								X								
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass									X				X	X	X	X	
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine					X												
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple								X									
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern						X											
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X														X	
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X																
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X	X														
Pluchea baccharis	Rosy camphorweed	X																
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X																
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X											X				
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia																	
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X			X													
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem			X														
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X															
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X													X		
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier															X		
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X		X						X							
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X			X		X		X									

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T62-QN	T62-QS	T62-QE	T62-QW	T62-Add	T63-QN	T63-QS	T63-QE	T63-QW	T63-Add	T64-QN	T64-QS	T64-QE	T64-QW	T64-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X			X	X			X							X		
Aeschynomene indica	India joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Aletris lutea	Yellow colic-root		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed	X	X															
Ammannia latifolia	Pink redstem	X																
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X						X							X		
Andropogon virginicus	Broomsedge	X	X							X								
Aristida stricta	Wiregrass		X							X								
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Blechnum serrulatum	Swamp fern																	
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts		X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry																	
Carex elliottii	Elliot's sedge																	
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush		X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat	X																
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chromolaena odorata	Jack-in-the-bush	X																
Cirsium nuttallii	Nuttall's thistle	X																
Cladonia sp.	Deer moss																	
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed	X														X		
Coreopsis floridana	Florida tickseed		X															
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box	X																
Cuphea carthagenensis	Columbian waxweed	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Cynodon dactylon	Bermuda grass																	
Cyperus alopecuroides	Foxtail flatsedge																	
Cyperus compressus	Poorland flatsedge	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus difformis	Variable flatsedge	X																
Cyperus flavescens	Yellow flatsedge																	
Cyperus haspan	Haspan flatsedge	X																
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge																	
Cyperus polystachyos	Manyspike flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus rotundus	Nutgrass																	
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X							**X**									
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass																	
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium leucothrix	Rough witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X	**X**														
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed	X	X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead	X																
Eleocharis vivipara	Spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Eleusine indica	Indian goosegrass																	
Emilia fosbergii	Florida tasselflower	X																
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass	X																
Eragrostis elliottii	Elliot's lovegrass	X	X	**X**														
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Eupatorium capillifolium	Dogfennel		X						**X**					**X**	**X**			
Eupatorium serotinum	Late-flowering thorough-wort																	
Eustachys glauca	Saltmarsh fingergrass	X	X															
Eustachys petraea	Rock fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X						**X**									
Fimbristylis autumnalis	Fringe-rush		X									**X**						
Fimbristylis dichotoma	Forked fimbry	X																

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Froelichia floridana	Cottonweed	X	X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hemarthria altissima	Limpograss																	
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X						X									
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X															
Hyptis spicigera	Marubio																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																
Indigofera caroliniana	Carolina indigo																	
Indigofera hirsuta	Hairy indigo	X		X						X								
Ipomoea aquatica	Water morning glory			X					X									
Ipomoea triloba	Littlebell																	
Juncus effusus	Softrush																	
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush		X															
Justicia ovata	Loose-flower waterwillow																	
Kyllinga brevifolia	Shortleaf spikesedge																	
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton		X															
Lactuca graminifolia	Grassleaf lettuce																	
Lechea cernua	Nodding pinweed																	
Lechea deckertii	Deckert's pinweed																	
Lepidium virginicum	Pepper grass																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Liatris spicata	Dense gayfether	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X		X		X	X				X	X						
Lindernia grandiflora	False pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X	X						X	X	X							
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia	X	X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Lythrum alatum	Winged lythrum	X																
Macroptilium lathyroides	Phaseolus																	
Melinis repens	Natalgrass			X	X	X	X											
Melochia corchorifolia	Chocolate-weed	X																
Micranthemum umbrosum	Shade mudflower	X																
Mikania scandens	Climbing hempvine																	
Mollugo verticillata	Green carpetweed	X																
Momordica charantia	Wild balsam apple																	
Muhlenbergia capillaris	Gulf muhly grass		X															
Murdannia nudiflora	Naked-stem dewflower	X																
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane	X	X															
Panicum repens	Torpedo grass	X																
Panicum rigidulum	Red-top panic grass	X																
Panicum verrucosum	Warty panic grass		X															
Parietaria floridana	Florida pellitory																	
Paspalum acuminatum	Brook paspalum																	
Paspalum notatum	Bahia grass																	
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass	X																
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		X						X						X		
Phytolacca americana	Common pokeweed	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Pluchea baccharis	Rosy camphorweed	X		X														
Pluchea odorata	Sweetscent	X																
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		X					X			X						
Portulaca pilosa	Pink purslane																	
Praxelis clematidea	Praxelis	X				X												
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Pteroglossaspis ecrsistata	Giant orchid	X	X															
Ptilimnium capillaceum	Bishop-weed																	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Quercus geminata	Sand live oak																	
Quercus laurifolia	Laurel oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Richardia brasiliensis	Richardia			X														
Richardia grandiflora	Largeflower Mexican clover																	
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Schizachyrium stoloniferum	Creeping little bluestem																	
Scleria baldwinii	Baldwin's nutrush																	
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scoparia dulcis	Licorice weed	X	X			X			X	X	X	X					X	
Senna occidentalis	Septicweed																	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod																	
Sesbania vesicaria	Bladderpod																	
Setaria parviflora	Knotroot bristle grass	X	X											X				
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X		X					X									
Sporobolus indicus	Smutgrass	X			X				X	X								
Stillingia aquatica	Watertoothleaf	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris interrupta	Shield fern																	
Tillandsia usneoides	Spanish moss																	
Toxicodendron radicans	Poison ivy																	
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X					X					X	X	X	X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T65-QN	T65-QS	T65-QE	T65-QW	T65-Add	T66-QN	T66-QS	T66-QE	T66-QW	T66-Add	T67-QN	T67-QS	T67-QE	T67-QW	T67-Add
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vicia acutifolia	Four-leaf vetch																	
Vigna luteola	Hairypod cowpea																	
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
Zingiber zerumbet	Bitter ginger																	
Total		**92**	**93***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Abutilon theophrasti	Velvetleaf	X											
Acalypha gracilens	Slender threeseed mercury		X										
Aeschynomene americana	Meadow joint-vetch	X											
Aeschynomene indica	India joint-vetch	X											
Agalinis fasciculata	Beach False-foxglove		X										
Aletris lutea	Yellow colic-root		X										
Alysicarpus ovalifolius	False moneywort	X											
Alysicarpus vaginalis	White moneywort												
Ambrosia artemisiifolia	Common ragweed	X	X										
Ammannia latifolia	Pink redstem	X											
Amphicarpum muehlenbergianum	Blue maidencane		X										
Andropogon glomeratus	Bushy bluestem	X	X										
Andropogon virginicus	Broomsedge	X	X						X				
Aristida stricta	Wiregrass		X		X								
Axonopus fissifolius	Southern carpet grass		X										
Axonopus furcatus	Flat-joint carpet grass		X										
Baccharis halimifolia	Eastern false-willow		X										
Berlandiera subacaulis	Florida greeneyes												
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X										
Blechnum serrulatum	Swamp fern												
Boehmeria cylindrica	Small-spike false nettle	X											
Buchnera americana	American bluehearts		X										
Bulbostylis barbata	Watergrass	X		X									
Callicarpa americana	American beauty-berry												
Carex elliottii	Elliot's sedge												
Carex longii	Long's sedge		X										
Carphephorus corymbosus	Florida paintbrush		X										
Carphephorus odoratissimus	Pineland purple		X										
Centella asiatica	Asian coinwort		X										
Ceratopteris thalictroides	Watersprite												
Chamaecrista nictitans	Wild sensitive plant		X										
Chamaesyce hirta	Pillpod sandmat	X											
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X											
Chromolaena odorata	Jack-in-the-bush	X											
Cirsium nuttallii	Nuttall's thistle	X											
Cladonia sp.	Deer moss												
Commelina diffusa	Dayflower	X											
Commelina gambiae	Gambian dayflower	X											
Conyza canadensis	Dwarf horseweed	X											
Coreopsis floridana	Florida tickseed		X										
Coreopsis leavenworthii	Leavenworth's tickseed	X	X								X		
Crotalaria pallida	Smooth rattle-box	X											
Crotalaria rotundifolia	Rabbitbells	X	X										
Crotalaria spectabilis	Rattle-box	X											
Cuphea carthagenensis	Columbian waxweed	X											

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Cynodon dactylon	Bermuda grass												
Cyperus alopecuroides	Foxtail flatsedge												
Cyperus compressus	Poorland flatsedge	X	X										
Cyperus croceus	Baldwin flatsedge	X	X							X		X	
Cyperus difformis	Variable flatsedge	X											
Cyperus flavescens	Yellow flatsedge												
Cyperus haspan	Haspan flatsedge	X											
Cyperus iria	Rice flatsedge												
Cyperus lanceolatus	Epiphytic flatsedge												
Cyperus polystachyos	Manyspike flatsedge		X										
Cyperus retrorsus	Pinebarren flatsedge	X	X									X	
Cyperus rotundus	Nutgrass												
Cyperus strigosus	Straw colored flatsedge	X											
Cyperus surinamensis	Tropical flatsedge	X											
Cyperus virens	Green flatsedge	X											
Desmodium incanum	Zarzabacao comun	X	X										
Desmodium triflorum	Beggarweed												
Dichanthelium aciculare	Needleleaf witchgrass		X										
Dichanthelium acuminatum	Panic grass											X	
Dichanthelium commutatum	Variable witchgrass												
Dichanthelium leucothrix	Rough witchgrass												
Digitaria ciliaris	Southern crabgrass	X	X										
Digitaria longiflora	Indian crabgrass												
Digitaria serotina	Hairy crabgrass		X										
Diodia virginiana	Rough button-weed	X	X										
Drymaria cordata	West Indian chickweed												
Eclipta prostrata	Upright burhead	X											
Eleocharis vivipara	Spikerush												
Elephantopus elatus	Tall elephantsfoot		X										
Eleusine indica	Indian goosegrass												
Emilia fosbergii	Florida tasselflower	X											
Emilia sonchifolia	Tasselflower	X											
Eragrostis atrovirens	Thalia lovegrass	X											
Eragrostis elliottii	Elliot's lovegrass	X	X		X		X						
Eragrostis spectabilis	Purple lovegrass		X										
Erechtites hieraciifolius	Fireweed		X										
Erigeron quercifolius	Oak-leaf fleabane	X	X										
Eupatorium capillifolium	Dogfennel		X										
Eupatorium serotinum	Late-flowering thorough-wort												
Eustachys glauca	Saltmarsh fingergrass	X	X		X								
Eustachys petraea	Rock fingergrass		X										
Euthamia caroliniana	Slender goldenrod		X										
Fimbristylis autumnalis	Fringe-rush		X										
Fimbristylis dichotoma	Forked fimbry	X											

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Froelichia floridana	Cottonweed	X	X										
Fuirena pumila	Umbrella-sedge												
Galactia elliotii	Milkpea		X						X				
Gamochaeta pensylvanica	Pennsylvania everlasting		X										
Helianthemum corymbosum	Pinebarren frostweed	X	X									X	
Helianthus angustifolius	Narrowleaf sunflower	X	X										
Hemarthria altissima	Limpograss												
Heterotheca subaxillaris	Camphorweed			X									
Hydrocotyle umbellata	Manyflower marshpennywort		X										
Hypericum cistifolium	Round-pod St. John's wort	X							X				
Hypericum tetrapetalum	St. John's wort		X										
Hyptis alata	Musky mint	X	X										
Hyptis spicigera	Marubio												
Hyptis verticillata	John Charles												
Imperata cylindrica	Cogon grass	X											
Indigofera caroliniana	Carolina indigo												
Indigofera hirsuta	Hairy indigo	X			X	X							
Ipomoea aquatica	Water morning glory												
Ipomoea triloba	Littlebell												
Juncus effusus	Softrush												
Juncus marginatus	Grassleaf rush	X	X										
Juncus megacephalus	Bighead rush												
Juncus scirpoides	Needlepod rush		X										
Justicia ovata	Loose-flower waterwillow												
Kyllinga brevifolia	Shortleaf spikesedge												
Lachnanthes caroliniana	Carolina redroot		X										
Lachnocaulon anceps	White-head bogbutton		X										
Lactuca graminifolia	Grassleaf lettuce												
Lechea cernua	Nodding pinweed												
Lechea deckertii	Deckert's pinweed												
Lepidium virginicum	Pepper grass												
Liatris gracilis	Slender goldenrod	X	X										
Liatris spicata	Dense gayfether		X										
Liatris spicata	Dense gayfether	X	X										
Licania michauxii	Gopher apple		X										
Lindernia crustacea	Malaysian false pimpernel	X			X								
Lindernia grandiflora	False pimpernel												
Ludwigia maritima	Seaside primrosewillow	X	X										
Ludwigia octovalvis	Large seedbox	X											
Ludwigia peruviana	Primrose willow	X											
Ludwigia repens	Red-leaf ludwigia	X	X										
Luziola fluitans	Southern watergrass												
Lycopodiella cernua	Nodding clubmoss												
Lygodium japonicum	Japanese climbing fern												

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Lyonia fruticosa	Coastplain Staggerbush		X										
Lyonia lucida	Fetterbush		X										
Lythrum alatum	Winged lythrum	X											
Macroptilium lathyroides	Phaseolus												
Melinis repens	Natalgrass					X						X	
Melochia corchorifolia	Chocolate-weed	X											
Micranthemum umbrosum	Shade mudflower	X											
Mikania scandens	Climbing hempvine												
Mollugo verticillata	Green carpetweed	X											
Momordica charantia	Wild balsam apple												
Muhlenbergia capillaris	Gulf muhly grass		X	X									
Murdannia nudiflora	Naked-stem dewflower	X											
Myrica cerifera	Wax myrtle		X										
Nephrolepis exaltata	Boston fern												
Oldenlandia corymbosa	Flattop mille graines												
Oldenlandia uniflora	Clustered millie graines		X										
Opuntia humifusa	Pricklypear		X										
Oxalis corniculata	Yellow wood sorrel	X	X	X									
Panicum dichotomiflorum	Fall panicum	X											
Panicum hemitomon	Maidencane	X	X						X				
Panicum repens	Torpedo grass	X											
Panicum rigidulum	Red-top panic grass	X											
Panicum verrucosum	Warty panic grass		X										
Parietaria floridana	Florida pellitory												
Paspalum acuminatum	Brook paspalum												
Paspalum notatum	Bahia grass									X	X	X	
Paspalum setaceum	Thin paspalum	X	X						X				
Paspalum urvillei	Vaseygrass	X											
Phyla nodiflora	Frog-fruit	X	X										
Phyllanthus urinaria	Chamberbitter	X											
Phytolacca americana	Common pokeweed	X											
Pinus elliottii	Slash pine		X										
Pityopsis graminifolia	Narrowleaf silkgrass		X										
Pluchea baccharis	Rosy camphorweed	X											
Pluchea odorata	Sweetscent	X											
Polygonum hydropiperoides	Mild waterpepper	X	X										
Polygonum punctatum	Dotted smartweed	X	X										
Polypremum procumbens	Rustweed	X		X	X	X							
Portulaca pilosa	Pink purslane												
Praxelis clematidea	Praxelis	X											
Pseudognaphalium obtusifolium	Rabbit tobacco		X										
Pteridium aquilinum	Bracken fern		X										
Pterocaulon pycnostachyum	Blackroot		X										
Pteroglossaspis ecrsistata	Giant orchid	X	X										
Ptilimnium capillaceum	Bishop-weed												

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Quercus geminata	Sand live oak												
Quercus laurifolia	Laurel oak												
Quercus virginiana	Live oak		X										
Rhexia mariana	Meadow-beauty	X	X										
Rhus copallinum	Winged sumac												
Rhynchospora fascicularis	Fasciculate beakrush	X	X										
Richardia brasiliensis	Richardia			X									
Richardia grandiflora	Largeflower Mexican clover												
Rubus argutus	Sawtooth blackberry												
Rubus cuneifolius	Sand Blackberry												
Rubus pensilvanicus	Sawtooth blackberry												
Sacciolepis indica	Glenwood grass	X											
Sacciolepis striata	American cupscale	X	X										
Sagittaria lancifolia	Bulltongue arrowhead	X											
Schizachyrium stoloniferum	Creeping little bluestem			X	X	X	X						
Scleria baldwinii	Baldwin's nutrush												
Scleria ciliata var. ciliata	Fringed nutrush		X										
Scoparia dulcis	Licorice weed	X	X	X									
Senna occidentalis	Septicweed												
Serenoa repens	Saw palmetto		X										
Sesbania herbacea	Danglepod												
Sesbania vesicaria	Bladderpod												
Setaria parviflora	Knotroot bristle grass	X	X										
Sida cordifolia	Llima												
Sida rhombifolia	Indian hemp		X										
Smilax auriculata	Earleaf greenbriar		X										
Smilax bona-nox	Saw greenbrier											X	
Solanum viarum	Tropical soda apple												
Solidago fistulosa	Pine-barren goldenrod		X										
Solidago odorata var. chapmanii	Chapman's goldenrod		X										
Solidago sempervirens	Seaside goldenrod												
Spartina bakeri	Sand cordgrass		X										
Spermacoce remota	Woodland false buttonweed												
Spermacoce verticillata	Shrubby false buttonweed	X		X									
Sporobolus indicus	Smutgrass	X											
Stillingia aquatica	Watertoothleaf	X											
Stillingia sylvatica	Queensdelight		X										
Striga gesnerioides	Cowpea Witchweed												
Symphyotrichum bahamense	Annual saltmarsh aster	X											
Thelypteris interrupta	Shield fern												
Tillandsia usneoides	Spanish moss												
Toxicodendron radicans	Poison ivy												
Tridax procumbens	Coatbuttons												
Typha sp.	Cattail												
Urena lobata	Caesarweed	X					X		X	X	X	X	

X = occurrence within the quadrat

TABLE 99: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T68-QN	T68-QS	T68-QE	T68-QW	T68-Add	T69-QN	T69-QS	T69-QE	T69-QW	T69-Add
Vaccinium corymbosum	Highbush blueberry												
Vaccinium myrsinites	Shiny blueberry		X										
Vicia acutifolia	Four-leaf vetch												
Vigna luteola	Hairypod cowpea												
Woodwardia areolata	Netted chain fern												
Woodwardia virginica	Virginia chain fern												
Xyris sp.	Yellow-eyed grass	X											
Yucca filamentosa	Adam's needle		X										
Zingiber zerumbet	Bitter ginger												
Total		**92**	**93***										

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 100: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Aeschynomene americana	Meadow joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X												X			
Aristida spiciformis	Pinebarren three-awn		X															
Axonopus fissifolius	Southern carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X			X												
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry								X									
Carex longii	Long's sedge		X															
Centella asiatica	Asian coinwort		X															
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X							X	X								
Commelina gambiae	Gambian dayflower																	
Coreopsis leavenworthii	Leavenworth's tickseed		X															
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus flavescens	Yellow flatsedge																	
Cyperus flavescens	Yellow flatsedge	X																
Cyperus strigosus	Straw colored flatsedge																	
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X														X		
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Drymaria cordata	West Indian chickweed																	
Elephantopus elatus	Tall elephantsfoot	X	X												X		X	
Emilia fosbergii	Florida tasselflower	X										X						
Erechtites hieraciifolius	Fireweed		X						X									
Eupatorium capillifolium	Dogfennel		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis dichotoma	Forked fimbry																	
Galactia elliotii	Milkpea		X											X	X		X	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine										X			X	X	X	X	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hyptis verticillata	John Charles					X	X			X								
Imperata cylindrica	Cogon grass			X	X	X	X											
Indigofera hirsuta	Hairy indigo	X																
Juncus effusus	Softrush	X																
Juncus megacephalus	Bighead rush																	
Kyllinga brevifolia	Shortleaf spikesedge	X																

X = Occurence within the quadrat

TABLE 100: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Lachnocaulon anceps	White-head bogbutton		X															
Lindernia crustacea	Malaysian false pimpernel	X																
Liquidambar styraciflua	Sweetgum																	
Ludwigia maritima	Seaside primrosewillow	X	X															
Lygodium japonicum	Japanese climbing fern			X	X	X	X											
Melothria pendula	Creeping cucumber																	
Momordica charantia	Wild balsam apple																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X															
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X											X	X		X	
Panicum maximum	Guineagrass																	
Panicum rigidulum	Red-top panic grass	X														X		
Parthenocissus quinquefolia	Virginia creeper																	
Paspalum notatum	Bahia grass													X	X		X	
Paspalum setaceum	Thin paspalum		X															
Pennisetum pupureum	Napier grass																	
Phyllanthus urinaria	Chamberbitter																	
Phytolacca americana	Common pokeweed																	
Polypremum procumbens	Rustweed																	
Pouzolzia zeylanica	Pouzolz's bush								X	X								
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pteridium aquilinum	Bracken fern		X															
Pteridium aquilinum var. pseudocaudatum	Tailed bracken									X		X						
Pterocaulon pycnostachyum	Blackroot		X															
Quercus nigra	Water oak																	
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Scleria baldwinii	Baldwin's nutrush																	
Scoparia dulcis	Licorice weed	X	X															
Setaria parviflora	Knotroot bristle grass	X	X								X							
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier								X	X	X						X	
Solidago fistulosa	Pine-barren goldenrod	X	X															
Spermacoce prostrata	Prostrate false buttonweed																	
Sporobolus indicus	Smutgrass																	
Toxicodendron radicans	Poison ivy									X								
Tridax procumbens	Coatbuttons	X																
Urena lobata	Caesarweed	X		X	X	X	X		X	X	X	X						
Urochloa mutica	Paragrass																	
Vitis rotundifolia	Muscadine grape								X			X						
Xyris sp.	Yellow-eyed grass	X																
Totals		**30**	**40***															

* Total number of HCPMRM List Species observed since monitoring started

X = Occurence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Acalypha gracilens	Slender threeseed mercury		X															
Agalinis fasciculata	Beach False-foxglove	X	X															
Ageratum houstonianum	Bluemink																	
Andropogon glomeratus	Bushy bluestem	X	X		**X**									**X**				
Andropogon ternarius	Splitbeard bluestem	X	X	**X**														
Andropogon virginicus	Broomsedge	X	X	**X**					**X**					**X**		**X**		
Aristida spiciformis	Pinebarren three-awn		X	**X**														
Aristida stricta	Wiregrass	X	X	**X**	**X**	**X**			**X**	**X**	**X**			**X**				
Asimina obovata	Bigflower pawpaw		X	**X**														
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Balduina angustifolia	Yellow buttons		X															
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry	X																
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush	X	X															
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Commelina gambiae	Gambian dayflower	X																
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X																
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X												X			
Cyperus strigosus	Straw colored flatsedge																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X			**X**													
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichanthelium portoricense	Hemlock witchgrass	X	X															
Diospyros virginiana	Persimmon																	
Drosera capillaris	Dwarf sundew		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Eragrostis elliottii	Elliot's lovegrass	X	X	**X**														
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane	X	X						**X**									
Erigeron strigosus	Prairie fleabane																	
Erucastrum gallicum	Common dogmustard	X	X															
Eryingium yuccifolium	Rattlesnake master		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium	X	X		**X**													
Eupatorium rotundifolium	False hoarhound		X															

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Euthamia caroliniana	Slender goldenrod		X		**X**	**X**			**X**								**X**	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine								**X**		**X**	**X**						
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X								**X**	**X**							
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X	**X**														
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis spicigera	Marubio																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Juncus scirpoides	Needlepod rush		X															
Lachnocaulon anceps	White-head bogbutton	X	X	**X**	**X**		**X**											
Lechea deckertii	Deckert's pinweed																	
Liatris gracilis	Slender goldenrod	X	X						**X**									
Liatris spicata	Dense gayfether		X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Ludwigia maritima	Seaside primrosewillow		X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia repens	Red-leaf ludwigia		X															
Lyonia fruticosa	Coastplain Staggerbush	X	X															
Lyonia lucida	Fetterbush		X															
Macroptilium lathyroides	Phaseolus																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X																
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X												**X**	**X**	**X**	**X**	
Paspalum setaceum	Thin paspalum	X	X								**X**							
Persea borbonia	Red bay																	
Piloblephis rigida	Wild pennyroyal	X	X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X												**X**			
Polygala rugelii	Yellow milwort		X															
Polygala lutea	Orange milkwort		X															
Polygala setacea	coastalplain milkwort		X															
Polypremum procumbens	Rustweed	X																

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T1-QN	T1-QS	T1-QE	T1-QW	T1-Add	T2-QN	T2-QS	T2-QE	T2-QW	T2-Add	T3-QN	T3-QS	T3-QE	T3-QW	T3-Add
Pteridium aquilinum	Bracken fern		X												**X**		**X**	
Pteris vittata	Chinese ladder brake																	
Pterocaulon pycnostachyum	Blackroot		X							**X**								
Quercus chapmanii	Chapman's oak		X															
Quercus inopina	Scrub oak																	
Quercus laevis	Turkey oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X						**X**									
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac						**X**											
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Sabal palmetto	Cabbage palm		X															
Sabatia brevifolia	Shortleaf rosegentian	X	X															
Sacciolepis indica	Glenwood grass	X																
Schizachyrium stoloniferum	Creeping little bluestem	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto		X	**X**	**X**	**X**	**X**											
Sesbania herbacea	Danglepod																	
Smilax auriculata	Earleaf greenbriar		X											**X**				
Smilax bona-nox	Saw greenbrier																	
Solidago fistulosa	Pine-barren goldenrod	X	X		**X**													
Solidago odorata var. chapmanii	Chapman's goldenrod		X											**X**		**X**		
Sorghastrum secundum	lopsided Indiangrass	X	X															
Stillingia sylvatica	Queensdelight	X	X															
Syngonanthus flavidulus	Bantam-buttons	X	X	**X**	**X**													
Tripsacum dactyloides	Fakahatchee grass																	
Urena lobata	Caesarweed													**X**				
Utricularia subulata	Bladderwort	X	X	**X**														
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry	X	X	**X**														
Vicia acutifolia	Four-leaf vetch																	
Viola sororia	Common blue violet																	
Vitis rotundifolia	Muscadine grape																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Yucca filamentosa	Adam's needle		X															
	Totals	**50**	**81***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Acalypha gracilens	Slender threeseed mercury		X															
Agalinis fasciculata	Beach False-foxglove	X	X															
Ageratum houstonianum	Bluemink																	
Andropogon glomeratus	Bushy bluestem	X	X								**X**			**X**				
Andropogon ternarius	Splitbeard bluestem	X	X													**X**		
Andropogon virginicus	Broomsedge	X	X			**X**			**X**					**X**				
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass	X	X	**X**	**X**		**X**								**X**	**X**		
Asimina obovata	Bigflower pawpaw		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Balduina angustifolia	Yellow buttons		X															
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry	X												X				
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush	X	X	**X**														
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Commelina gambiae	Gambian dayflower	X																
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X																
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X												**X**		**X**		
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichanthelium portoricense	Hemlock witchgrass	X	X															
Diospyros virginiana	Persimmon																	
Drosera capillaris	Dwarf sundew		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Eragrostis elliottii	Elliot's lovegrass	X	X												**X**			
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed	X	X											**X**				
Erigeron quercifolius	Oak-leaf fleabane	X	X															
Erigeron strigosus	Prairie fleabane																	
Erucastrum gallicum	Common dogmustard	X	X															
Eryingium yuccifolium	Rattlesnake master		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium	X	X	**X**					**X**							**X**	**X**	
Eupatorium rotundifolium	False hoarhound		X															

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Euthamia caroliniana	Slender goldenrod		X		**X**	**X**						**X**			**X**		**X**	
Galactia elliotii	Milkpea		X			**X**								**X**				
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine			**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**						
Helianthemum corymbosum	Pinebarren frostweed	X	X															
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X											**X**				
Hypericum cistifolium	Round-pod St. John's wort	X												**X**				
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X											**X**				
Hyptis spicigera	Marubio																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass																	
Juncus scirpoides	Needlepod rush		X															
Lachnocaulon anceps	White-head bogbutton	X	X											**X**				
Lechea deckertii	Deckert's pinweed																	
Liatris gracilis	Slender goldenrod	X	X															
Liatris spicata	Dense gayfether		X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Ludwigia maritima	Seaside primrosewillow		X															
Ludwigia octovalvis	Large seedbox	X												**X**				
Ludwigia repens	Red-leaf ludwigia		X															
Lyonia fruticosa	Coastplain Staggerbush	X	X							**X**								
Lyonia lucida	Fetterbush		X															
Macroptilium lathyroides	Phaseolus																	
Nephrolepis exaltata	Boston fern																X	
Oldenlandia uniflora	Clustered millie graines		X											**X**				
Opuntia humifusa	Pricklypear		X															
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X																
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X															
Persea borbonia	Red bay																	
Piloblephis rigida	Wild pennyroyal	X	X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Polygala rugelii	Yellow milwort		X															
Polygala lutea	Orange milkwort		X															
Polygala setacea	coastalplain milkwort		X															
Polypremum procumbens	Rustweed	X																

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T4-QN	T4-QS	T4-QE	T4-QW	T4-Add	T5-QN	T5-QS	T5-QE	T5-QW	T5-Add	T6-QN	T6-QS	T6-QE	T6-QW	T6-Add
Pteridium aquilinum	Bracken fern		X		X	X			X	X	X	X						
Pteris vittata	Chinese ladder brake																	
Pterocaulon pycnostachyum	Blackroot		X															
Quercus chapmanii	Chapman's oak		X															
Quercus inopina	Scrub oak																	
Quercus laevis	Turkey oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X															
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac			X	X		X							X			X	
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Rubus argutus	Sawtooth blackberry													X				
Rubus cuneifolius	Sand Blackberry																	
Sabal palmetto	Cabbage palm		X															
Sabatia brevifolia	Shortleaf rosegentian	X	X															
Sacciolepis indica	Glenwood grass	X															X	
Schizachyrium stoloniferum	Creeping little bluestem	X																
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto		X	X	X	X	X		X			X		X	X	X	X	
Sesbania herbacea	Danglepod																	
Smilax auriculata	Earleaf greenbriar		X							X								
Smilax bona-nox	Saw greenbrier																	
Solidago fistulosa	Pine-barren goldenrod	X	X												X			
Solidago odorata var. chapmanii	Chapman's goldenrod		X	X		X			X			X						
Sorghastrum secundum	lopsided Indiangrass	X	X							X	X							
Stillingia sylvatica	Queensdelight	X	X															
Syngonanthus flavidulus	Bantam-buttons	X	X															
Tripsacum dactyloides	Fakahatchee grass																	
Urena lobata	Caesarweed																	
Utricularia subulata	Bladderwort	X	X															
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry	X	X															
Vicia acutifolia	Four-leaf vetch													X				
Viola sororia	Common blue violet														X			
Vitis rotundifolia	Muscadine grape													X				
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X									X							
Yucca filamentosa	Adam's needle		X															
	Totals	**50**	**81***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Acalypha gracilens	Slender threeseed mercury		X															
Agalinis fasciculata	Beach False-foxglove	X	X															
Ageratum houstonianum	Bluemink																	
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon ternarius	Splitbeard bluestem	X	X				X											
Andropogon virginicus	Broomsedge	X	X	X					X					X				
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass	X	X		X	X	X			X	X			X		X	X	
Asimina obovata	Bigflower pawpaw		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Balduina angustifolia	Yellow buttons		X															
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X								X	X							
Callicarpa americana	American beauty-berry	X																
Carex longii	Long's sedge		X															
Carphephorus corymbosus	Florida paintbrush	X	X				X											
Carphephorus odoratissimus	Pineland purple		X															
Centella asiatica	Asian coinwort		X											X				
Chamaecrista nictitans	Wild sensitive plant		X															
Commelina gambiae	Gambian dayflower	X																
Crotalaria spectabilis	Rattle-box	X																
Croton michauxii	Rushfoil	X																
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge																	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X			X													
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Dichanthelium portoricense	Hemlock witchgrass	X	X															
Diospyros virginiana	Persimmon																	
Drosera capillaris	Dwarf sundew		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass	X	X															
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane	X	X						X									
Erigeron strigosus	Prairie fleabane																	
Erucastrum gallicum	Common dogmustard	X	X															
Eryingium yuccifolium	Rattlesnake master		X															
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium	X	X				X											
Eupatorium rotundifolium	False hoarhound		X															

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Euthamia caroliniana	Slender goldenrod		X	**X**			**X**		**X**		**X**			**X**	**X**	**X**		
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine																	
Helianthemum corymbosum	Pinebarren frostweed	X	X				**X**											
Heterotheca subaxillaris	Camphorweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X						**X**									
Hyptis spicigera	Marubio																	
Ilex glabra	Gallberry		X															
Imperata cylindrica	Cogon grass									**X**	**X**	**X**						
Juncus scirpoides	Needlepod rush		X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Lechea deckertii	Deckert's pinweed																	
Liatris gracilis	Slender goldenrod	X	X											**X**				
Liatris spicata	Dense gayfether		X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Ludwigia maritima	Seaside primrosewillow		X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia repens	Red-leaf ludwigia		X															
Lyonia fruticosa	Coastplain Staggerbush	X	X															
Lyonia lucida	Fetterbush		X															
Macroptilium lathyroides	Phaseolus																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X					**X**							**X**				
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X																
Paspalum setaceum	Thin paspalum	X	X	**X**														
Persea borbonia	Red bay																	
Piloblephis rigida	Wild pennyroyal	X	X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X											**X**				
Polygala rugelii	Yellow milwort		X															
Polygala lutea	Orange milkwort		X															
Polygala setacea	coastalplain milkwort		X															
Polypremum procumbens	Rustweed	X																

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T7-QN	T7-QS	T7-QE	T7-QW	T7-Add	T8-QN	T8-QS	T8-QE	T8-QW	T8-Add	T9-QN	T9-QS	T9-QE	T9-QW	T9-Add
Pteridium aquilinum	Bracken fern		X															
Pteris vittata	Chinese ladder brake																	
Pterocaulon pycnostachyum	Blackroot		X						**X**									
Quercus chapmanii	Chapman's oak		X															
Quercus inopina	Scrub oak																	
Quercus laevis	Turkey oak																	
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak		X											**X**			**X**	
Rhexia mariana	Meadow-beauty	X	X															
Rhus copallinum	Winged sumac								**X**									
Rhynchospora fascicularis	Fasciculate beakrush	X	X															
Rhynchospora microcarpa	Southern beakrush	X																
Rubus argutus	Sawtooth blackberry																	
Rubus cuneifolius	Sand Blackberry																	
Sabal palmetto	Cabbage palm		X															
Sabatia brevifolia	Shortleaf rosegentian	X	X															
Sacciolepis indica	Glenwood grass	X																
Schizachyrium stoloniferum	Creeping little bluestem	X												**X**				
Scoparia dulcis	Licorice weed	X	X							**X**								
Serenoa repens	Saw palmetto		X											**X**				
Sesbania herbacea	Danglepod																	
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solidago fistulosa	Pine-barren goldenrod	X	X															
Solidago odorata var. chapmanii	Chapman's goldenrod		X						**X**									
Sorghastrum secundum	lopsided Indiangrass	X	X															
Stillingia sylvatica	Queensdelight	X	X	**X**			**X**											
Syngonanthus flavidulus	Bantam-buttons	X	X	**X**														
Tripsacum dactyloides	Fakahatchee grass																	
Urena lobata	Caesarweed																	
Utricularia subulata	Bladderwort	X	X															
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry	X	X															
Vicia acutifolia	Four-leaf vetch																	
Viola sororia	Common blue violet																	
Vitis rotundifolia	Muscadine grape																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X														**X**		
Yucca filamentosa	Adam's needle		X															
	Totals	**50**	**81***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Acalypha gracilens	Slender threeseed mercury		X					
Agalinis fasciculata	Beach False-foxglove	X	X					
Ageratum houstonianum	Bluemink							
Andropogon glomeratus	Bushy bluestem	X	X					
Andropogon ternarius	Splitbeard bluestem	X	X					
Andropogon virginicus	Broomsedge	X	X	**X**				
Aristida spiciformis	Pinebarren three-awn		X	**X**				
Aristida stricta	Wiregrass	X	X	**X**	**X**	**X**	**X**	
Asimina obovata	Bigflower pawpaw		X					
Axonopus furcatus	Flat-joint carpet grass		X					
Baccharis halimifolia	Eastern false-willow		X					
Balduina angustifolia	Yellow buttons		X					
Buchnera americana	American bluehearts	X	X					
Bulbostylis barbata	Watergrass	X						
Callicarpa americana	American beauty-berry	X						
Carex longii	Long's sedge		X					
Carphephorus corymbosus	Florida paintbrush	X	X					
Carphephorus odoratissimus	Pineland purple		X					
Centella asiatica	Asian coinwort		X					
Chamaecrista nictitans	Wild sensitive plant		X					
Commelina gambiae	Gambian dayflower	X						
Crotalaria spectabilis	Rattle-box	X						
Croton michauxii	Rushfoil	X		**X**				
Cyperus croceus	Baldwin flatsedge	X	X	X				
Cyperus retrorsus	Pinebarren flatsedge	X	X				X	
Cyperus strigosus	Straw colored flatsedge							
Dichanthelium aciculare	Needleleaf witchgrass		X					
Dichanthelium acuminatum	Panic grass	X						
Dichanthelium commutatum	Variable witchgrass							
Dichanthelium ensifolium	Cypress witchgrass		X					
Dichanthelium portoricense	Hemlock witchgrass	X	X					
Diospyros virginiana	Persimmon							
Drosera capillaris	Dwarf sundew		X					
Eleocharis baldwinii	Baldwin's spikerush		X					
Elephantopus elatus	Tall elephantsfoot		X					
Eragrostis elliottii	Elliot's lovegrass	X	X	**X**				
Eragrostis spectabilis	Purple lovegrass	X	X					
Erechtites hieraciifolius	Fireweed	X	X					
Erigeron quercifolius	Oak-leaf fleabane	X	X					
Erigeron strigosus	Prairie fleabane							
Erucastrum gallicum	Common dogmustard	X	X					
Eryingium yuccifolium	Rattlesnake master		X					
Eupatorium capillifolium	Dogfennel		X					
Eupatorium mohrii	Eupatorium	X	X					
Eupatorium rotundifolium	False hoarhound		X					

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Euthamia caroliniana	Slender goldenrod		X	**X**	**X**	**X**	**X**	
Galactia elliotii	Milkpea		X	**X**				
Gamochaeta pensylvanica	Pennsylvania everlasting		X					
Gelsemium sempervirens	Yellow jessamine							
Helianthemum corymbosum	Pinebarren frostweed	X	X					
Heterotheca subaxillaris	Camphorweed	X						
Hydrocotyle umbellata	Manyflower marshpennywort		X					
Hypericum cistifolium	Round-pod St. John's wort	X						
Hypericum fasciculatum	Sand-weed St. John's-wort							
Hypericum tetrapetalum	St. John's wort	X	X					
Hypoxis juncea	Yellow star grass		X					
Hyptis alata	Musky mint		X					
Hyptis spicigera	Marubio							
Ilex glabra	Gallberry		X					
Imperata cylindrica	Cogon grass							
Juncus scirpoides	Needlepod rush		X					
Lachnocaulon anceps	White-head bogbutton	X	X					
Lechea deckertii	Deckert's pinweed			**X**				
Liatris gracilis	Slender goldenrod	X	X					
Liatris spicata	Dense gayfether		X					
Licania michauxii	Gopher apple		X					
Lindernia crustacea	Malaysian false pimpernel							
Ludwigia maritima	Seaside primrosewillow		X					
Ludwigia octovalvis	Large seedbox	X						
Ludwigia repens	Red-leaf ludwigia		X					
Lyonia fruticosa	Coastplain Staggerbush	X	X					
Lyonia lucida	Fetterbush		X					
Macroptilium lathyroides	Phaseolus							
Nephrolepis exaltata	Boston fern							
Oldenlandia uniflora	Clustered millie graines		X					
Opuntia humifusa	Pricklypear		X				**X**	
Panicum anceps	Beaked panic grass		X					
Panicum hemitomon	Maidencane		X					
Panicum rigidulum	Red-top panic grass	X						
Paspalum dilatatum	Dallisgrass							
Paspalum notatum	Bahia grass	X						
Paspalum setaceum	Thin paspalum	X	X					
Persea borbonia	Red bay							
Piloblephis rigida	Wild pennyroyal	X	X	**X**	**X**	**X**	**X**	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X					
Polygala rugelii	Yellow milwort		X					
Polygala lutea	Orange milkwort		X					
Polygala setacea	coastalplain milkwort		X					
Polypremum procumbens	Rustweed	X		**X**				

X = occurrence within the quadrat

TABLE 101: HERBACEOUS INVENTORY MATRIX - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T10-QN	T10-QS	T10-QE	T10-QW	T10-Add
Pteridium aquilinum	Bracken fern		X					
Pteris vittata	Chinese ladder brake							
Pterocaulon pycnostachyum	Blackroot		X			**X**		
Quercus chapmanii	Chapman's oak		X					
Quercus inopina	Scrub oak							
Quercus laevis	Turkey oak							
Quercus laurifolia	Laurel oak							
Quercus nigra	Water oak							
Quercus pumila	Running oak		X	**X**	**X**	**X**	**X**	
Rhexia mariana	Meadow-beauty	X	X					
Rhus copallinum	Winged sumac			**X**				
Rhynchospora fascicularis	Fasciculate beakrush	X	X					
Rhynchospora microcarpa	Southern beakrush	X						
Rubus argutus	Sawtooth blackberry							
Rubus cuneifolius	Sand Blackberry							
Sabal palmetto	Cabbage palm		X					
Sabatia brevifolia	Shortleaf rosegentian	X	X	**X**	**X**		**X**	
Sacciolepis indica	Glenwood grass	X						
Schizachyrium stoloniferum	Creeping little bluestem	X						
Scoparia dulcis	Licorice weed	X	X					
Serenoa repens	Saw palmetto		X	**X**				
Sesbania herbacea	Danglepod							
Smilax auriculata	Earleaf greenbriar		X					
Smilax bona-nox	Saw greenbrier			**X**				
Solidago fistulosa	Pine-barren goldenrod	X	X					
Solidago odorata var. chapmanii	Chapman's goldenrod		X					
Sorghastrum secundum	lopsided Indiangrass	X	X					
Stillingia sylvatica	Queensdelight	X	X					
Syngonanthus flavidulus	Bantam-buttons	X	X					
Tripsacum dactyloides	Fakahatchee grass							
Urena lobata	Caesarweed							
Utricularia subulata	Bladderwort	X	X					
Vaccinium corymbosum	Highbush blueberry					**X**		
Vaccinium myrsinites	Shiny blueberry	X	X	**X**	**X**			
Vicia acutifolia	Four-leaf vetch							
Viola sororia	Common blue violet							
Vitis rotundifolia	Muscadine grape							
Woodwardia virginica	Virginia chain fern							
Xyris sp.	Yellow-eyed grass	X						
Yucca filamentosa	Adam's needle		X					
	Totals	**50**	**81***					

* Total number of HCPMRM List Species observed since monitoring started

X = occurrence within the quadrat

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T77-QN	T77-QS	T77-QE	T77-QW	T77-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T79-QN	T79-QS	T79-QE	T79-QW	T79-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury	X	X															
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch	X													X	X	X	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X												X	X		X	
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X								X							
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X						X									
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X			X													
Chamaesyce mendezii	Mendez's sandmat																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed			X	X						X					X	X	
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						X									
Crassocephalum crepidioides	Redflower ragleaf																	
Crotalaria pallida	Smooth rattle-box	X					X		X						X		X	
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X									X						

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T77-QN	T77-QS	T77-QE	T77-QW	T77-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T79-QN	T79-QS	T79-QE	T79-QW	T79-Add
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X						X									
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X			X						X						
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X		X	X					X		X						
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X								X							
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X					X											
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Erigeron strigosus	Prairie fleabane																	
Erythrina herbacea	Coral bean		X															
Eupatorium capillifolium	Dogfennel		X	X	X					X	X	X		X				
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound	X	X							X								
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X								X			X	X	X	X	
Fimbristylis autumnalis	Fringe-rush	X	X															
Fimbristylis dichotoma	Forked fimbry	X					X											
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X			X												
Galium tinctorium	Bedstraw																	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X		X													
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T77-QN	T77-QS	T77-QE	T77-QW	T77-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T79-QN	T79-QS	T79-QE	T79-QW	T79-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X						X									
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X	X						X	X							
Hypoxis juncea	Yellow star grass		X						X									
Hyptis alata	Musky mint		X						X									
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X												X	X	X		
Indigofera hirsuta	Hairy indigo																	
Ipomoea hederifolia	Scarletcreeper		X															
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush		X															
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton	X	X						X									
Leonotis nepetifolia	Lion's ear																	
Liatris gracilis	Slender goldenrod	X	X															
Lindernia crustacea	Malaysian false pimpernel	X		X			X		X									
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X							X									
Ludwigia peruviana	Primrose willow	X							X									
Ludwigia repens	Red-leaf ludwigia		X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum		X															
Macroptilium lathyroides	Phaseolus	X																
Melinis repens	Natalgrass	X							X									
Melochia corchorifolia	Chocolate-weed	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine	X																
Mollugo verticillata	Green carpetweed																	
Muhlenbergia capillaris	Gulf muhly grass	X	X															
Murdannia nudiflora	Naked-stem dewflower			X														
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X				X											
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X							X		X		X				

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T77-QN	T77-QS	T77-QE	T77-QW	T77-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T79-QN	T79-QS	T79-QE	T79-QW	T79-Add
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X						X									
Panicum rigidulum	Red-top panic grass	X	X								X							
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X			X	X								X				
Paspalum setaceum	Thin paspalum	X	X								X	X						
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		X	X	X	X		X					X				
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X						X									
Pluchea odorata	Sweetscent																	
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X						X									
Polypremum procumbens	Rustweed	X		X						X				X				
Portulaca pilosa	Pink purslane	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pterocaulon pycnostachyum	Blackroot		X							X	X							
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus laurifolia	Laurel oak		X															
Quercus minima	Dwarf live oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhododendron viscosum	Swamp azalea	X																
Rhynchospora fascicularis	Fasciculate beakrush		X															
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sacciolepis indica	Glenwood grass	X							X									
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Sagittaria subulata	Awl-leaf arrowhead																	
Scleria ciliata var. ciliata	Fringed nutrush	X	X						X									
Scoparia dulcis	Licorice weed	X	X	X					X	X		X						
Serenoa repens	Saw palmetto		X						X	X								
Sesbania herbacea	Danglepod	X	X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp	X	X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T77-QN	T77-QS	T77-QE	T77-QW	T77-Add	T78-QN	T78-QS	T78-QE	T78-QW	T78-Add	T79-QN	T79-QS	T79-QE	T79-QW	T79-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod	X	X								**X**	**X**						
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		**X**	**X**		**X**			**X**		**X**				**X**		
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X															
Vicia acutifolia	Four-leaf vetch																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
Yucca aloifolia	Spanish bayonet																	
Yucca filamentosa	Adam's needle		X															
	Totals	**78**	**107***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T80-QN	T80-QS	T80-QE	T80-QW	T80-Add	T81-QN	T81-QS	T81-QE	T81-QW	T81-Add	T82-QN	T82-QS	T82-QE	T82-QW	T82-Add
Abutilon theophrasti	Velvetleaf	X																
Acalypha gracilens	Slender threeseed mercury	X	X															
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch	X		**X**	**X**	**X**	**X**											
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X			**X**		**X**											
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X		**X**													
Andropogon virginicus	Broomsedge	X	X	**X**														
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X	**X**														
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce mendezii	Mendez's sandmat																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X		**X**														
Conyza canadensis	Dwarf horseweed			**X**														
Coreopsis leavenworthii	Leavenworth's tickseed	X	X	**X**														
Crassocephalum crepidioides	Redflower ragleaf																	
Crotalaria pallida	Smooth rattle-box	X		**X**														
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T80-QN	T80-QS	T80-QE	T80-QW	T80-Add	T81-QN	T81-QS	T81-QE	T81-QW	T81-Add	T82-QN	T82-QS	T82-QE	T82-QW	T82-Add
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X									**X**						
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X									**X**						
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X		**X**		**X**	**X**											
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X																
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed	X	X							**X**								
Erigeron quercifolius	Oak-leaf fleabane		X															
Erigeron strigosus	Prairie fleabane																	
Erythrina herbacea	Coral bean		X															
Eupatorium capillifolium	Dogfennel		X				**X**		**X**					**X**				
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound	X	X															
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush	X	X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw																	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T80-QN	T80-QS	T80-QE	T80-QW	T80-Add	T81-QN	T81-QS	T81-QE	T81-QW	T81-Add	T82-QN	T82-QS	T82-QE	T82-QW	T82-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X					**X**											
Indigofera hirsuta	Hairy indigo																	
Ipomoea hederifolia	Scarletcreeper		X															
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush		X															
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Leonotis nepetifolia	Lion's ear																	
Liatris gracilis	Slender goldenrod	X	X															
Lindernia crustacea	Malaysian false pimpernel	X							**X**	**X**	**X**							
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X	**X**		**X**												
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia		X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum		X															
Macroptilium lathyroides	Phaseolus	X																
Melinis repens	Natalgrass	X																
Melochia corchorifolia	Chocolate-weed	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine	X																
Mollugo verticillata	Green carpetweed																	
Muhlenbergia capillaris	Gulf muhly grass	X	X			**X**												
Murdannia nudiflora	Naked-stem dewflower																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X	**X**														

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T80-QN	T80-QS	T80-QE	T80-QW	T80-Add	T81-QN	T81-QS	T81-QE	T81-QW	T81-Add	T82-QN	T82-QS	T82-QE	T82-QW	T82-Add
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X	X															
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X		**X**														
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		**X**	**X**				**X**	**X**								
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent																	
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		**X**	**X**													
Portulaca pilosa	Pink purslane	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pterocaulon pycnostachyum	Blackroot		X															
Ptilimnium capillaceum	Bishop-weed	X	X	**X**														
Quercus laurifolia	Laurel oak		X															
Quercus minima	Dwarf live oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhododendron viscosum	Swamp azalea	X																
Rhynchospora fascicularis	Fasciculate beakrush		X															
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Sagittaria subulata	Awl-leaf arrowhead																	
Scleria ciliata var. ciliata	Fringed nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X	**X**	**X**	**X**	**X**		**X**		**X**	**X**						
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X	X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp	X	X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T80-QN	T80-QS	T80-QE	T80-QW	T80-Add	T81-QN	T81-QS	T81-QE	T81-QW	T81-Add	T82-QN	T82-QS	T82-QE	T82-QW	T82-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod	X	X															
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X																
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		**X**								**X**		**X**				
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X															
Vicia acutifolia	Four-leaf vetch																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
Yucca aloifolia	Spanish bayonet																	
Yucca filamentosa	Adam's needle		X															
	Totals	**78**	**107***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T83-QN	T83-QS	T83-QE	T83-QW	T83-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add
Abutilon theophrasti	Velvetleaf	X			**X**				**X**									
Acalypha gracilens	Slender threeseed mercury	X	X															
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch	X		**X**	**X**	**X**												
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X															
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce mendezii	Mendez's sandmat																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed						**X**											
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crassocephalum crepidioides	Redflower ragleaf																	
Crotalaria pallida	Smooth rattle-box	X			**X**		**X**											
Crotalaria rotundifolia	Rabbitbells	X	X				**X**											
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T83-QN	T83-QS	T83-QE	T83-QW	T83-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass								X									
Cyperus croceus	Baldwin flatsedge	X	X											X				
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X		X	X		X											
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X																
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Erigeron strigosus	Prairie fleabane																	
Erythrina herbacea	Coral bean		X															
Eupatorium capillifolium	Dogfennel		X						X									
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound	X	X															
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X															
Fimbristylis autumnalis	Fringe-rush	X	X															
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw																	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T83-QN	T83-QS	T83-QE	T83-QW	T83-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X		X											X			
Indigofera hirsuta	Hairy indigo																	
Ipomoea hederifolia	Scarletcreeper		X															
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush		X															
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Leonotis nepetifolia	Lion's ear																	
Liatris gracilis	Slender goldenrod	X	X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia		X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum		X															
Macroptilium lathyroides	Phaseolus	X																
Melinis repens	Natalgrass	X																
Melochia corchorifolia	Chocolate-weed	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine	X																
Mollugo verticillata	Green carpetweed																	
Muhlenbergia capillaris	Gulf muhly grass	X	X															
Murdannia nudiflora	Naked-stem dewflower																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T83-QN	T83-QS	T83-QE	T83-QW	T83-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X	X															
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X		**X**		**X**												
Paspalum setaceum	Thin paspalum	X	X															
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		**X**	**X**												**X**	
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent																	
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X		**X**														
Portulaca pilosa	Pink purslane	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pterocaulon pycnostachyum	Blackroot		X															
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus laurifolia	Laurel oak		X															
Quercus minima	Dwarf live oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhododendron viscosum	Swamp azalea	X																
Rhynchospora fascicularis	Fasciculate beakrush		X															
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Sagittaria subulata	Awl-leaf arrowhead																	
Scleria ciliata var. ciliata	Fringed nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X	**X**			**X**										**X**	
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X	X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp	X	X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier								**X**									

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T83-QN	T83-QS	T83-QE	T83-QW	T83-Add	T84-QN	T84-QS	T84-QE	T84-QW	T84-Add	T85-QN	T85-QS	T85-QE	T85-QW	T85-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod	X	X															
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X					**X**		**X**									
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X			**X**		**X**		**X**									
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X															
Vicia acutifolia	Four-leaf vetch																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
Yucca aloifolia	Spanish bayonet																	
Yucca filamentosa	Adam's needle		X															
	Totals	**78**	**107***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T86-QN	T86-QS	T86-QE	T86-QW	T86-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T88-QN	T88-QS	T88-QE	T88-QW	T88-Add
Abutilon theophrasti	Velvetleaf	X										**X**		**X**				
Acalypha gracilens	Slender threeseed mercury	X	X											**X**				
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch	X		**X**								**X**		**X**				
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X				**X**								**X**				
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed		X								**X**							
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X															
Andropogon virginicus	Broomsedge	X	X							**X**								
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X				**X**								**X**				
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X									**X**						
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant		X									**X**						
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce mendezii	Mendez's sandmat																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed				**X**	**X**	**X**				**X**							
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crassocephalum crepidioides	Redflower ragleaf																	
Crotalaria pallida	Smooth rattle-box	X												**X**				
Crotalaria rotundifolia	Rabbitbells	X	X								**X**							
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T86-QN	T86-QS	T86-QE	T86-QW	T86-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T88-QN	T88-QS	T88-QE	T88-QW	T88-Add
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass														X		X	
Cyperus croceus	Baldwin flatsedge	X	X						X									
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X						X									
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X			X			X									
Desmodium triflorum	Beggarweed	X		X					X									
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X				X			X	X	X	X						
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Erigeron strigosus	Prairie fleabane																	
Erythrina herbacea	Coral bean		X															
Eupatorium capillifolium	Dogfennel		X						X					X			X	
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound	X	X															
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X							X	X			X				
Fimbristylis autumnalis	Fringe-rush	X	X														X	
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X								X							
Galium tinctorium	Bedstraw																	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X		X		X											
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T86-QN	T86-QS	T86-QE	T86-QW	T86-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T88-QN	T88-QS	T88-QE	T88-QW	T88-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X														**X**	
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X												**X**		**X**		
Indigofera hirsuta	Hairy indigo																	
Ipomoea hederifolia	Scarletcreeper		X															
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush		X															
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Leonotis nepetifolia	Lion's ear																	
Liatris gracilis	Slender goldenrod	X	X							**X**								
Lindernia crustacea	Malaysian false pimpernel	X										**X**						
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia		X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum		X															
Macroptilium lathyroides	Phaseolus	X																
Melinis repens	Natalgrass	X																
Melochia corchorifolia	Chocolate-weed	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine	X																
Mollugo verticillata	Green carpetweed																	
Muhlenbergia capillaris	Gulf muhly grass	X	X															
Murdannia nudiflora	Naked-stem dewflower																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X											**X**				

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T86-QN	T86-QS	T86-QE	T86-QW	T86-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T88-QN	T88-QS	T88-QE	T88-QW	T88-Add
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X						X									
Panicum rigidulum	Red-top panic grass	X	X															
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X			X		X									X		
Paspalum setaceum	Thin paspalum	X	X							X								
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X												X				
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent																	
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X															
Polypremum procumbens	Rustweed	X				X				X	X			X				
Portulaca pilosa	Pink purslane	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis	X			X	X			X					X				
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pterocaulon pycnostachyum	Blackroot		X							X								
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus laurifolia	Laurel oak		X															
Quercus minima	Dwarf live oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhododendron viscosum	Swamp azalea	X																
Rhynchospora fascicularis	Fasciculate beakrush		X															
Richardia brasiliensis	Richardia	X							X					X				
Richardia grandiflora	Largeflower Mexican clover																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Sagittaria subulata	Awl-leaf arrowhead																	
Scleria ciliata var. ciliata	Fringed nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X	X	X	X			X	X				X		X		
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X	X															
Setaria parviflora	Knotroot bristle grass	X	X															
Sida rhombifolia	Indian hemp	X	X						X									
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T86-QN	T86-QS	T86-QE	T86-QW	T86-Add	T87-QN	T87-QS	T87-QE	T87-QW	T87-Add	T88-QN	T88-QS	T88-QE	T88-QW	T88-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod	X	X															
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X												**X**				
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X		**X**					**X**					**X**				
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		**X**			**X**					**X**		**X**				
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X															
Vicia acutifolia	Four-leaf vetch																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
Yucca aloifolia	Spanish bayonet																	
Yucca filamentosa	Adam's needle		X															
	Totals	**78**	**107***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T89-QN	T89-QS	T89-QE	T89-QW	T89-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add	T91-QN	T91-QS	T91-QE	T91-QW	T91-Add
Abutilon theophrasti	Velvetleaf	X												X				
Acalypha gracilens	Slender threeseed mercury	X	X	X											X		X	
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch	X		X											X		X	
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed		X	X														
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X	X			X											
Andropogon virginicus	Broomsedge	X	X											X				
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X															
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X											X				
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X														X	
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant		X														X	
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X																
Chamaesyce mendezii	Mendez's sandmat																	
Cirsium nuttallii	Nuttall's thistle	X												X			X	
Commelina diffusa	Dayflower	X		X														
Commelina gambiae	Gambian dayflower	X																
Conyza canadensis	Dwarf horseweed			X								X			X	X		
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crassocephalum crepidioides	Redflower ragleaf																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T89-QN	T89-QS	T89-QE	T89-QW	T89-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add	T91-QN	T91-QS	T91-QE	T91-QW	T91-Add
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X											X			X	
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X	X										X				
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Cyperus virens	Green flatsedge	X								X							X	
Desmodium incanum	Zarzabacao comun	X	X											X			X	
Desmodium triflorum	Beggarweed	X												X			X	
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X							X	X	X	X				X		
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X								X								
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed	X	X											X			X	
Erigeron quercifolius	Oak-leaf fleabane		X															
Erigeron strigosus	Prairie fleabane																	
Erythrina herbacea	Coral bean		X															
Eupatorium capillifolium	Dogfennel		X	X	X		X		X	X	X	X		X		X		
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound	X	X															
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X														X	
Fimbristylis autumnalis	Fringe-rush	X	X															
Fimbristylis dichotoma	Forked fimbry	X												X		X	X	
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X															
Galium tinctorium	Bedstraw																	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T89-QN	T89-QS	T89-QE	T89-QW	T89-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add	T91-QN	T91-QS	T91-QE	T91-QW	T91-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X		X	X								X	X	X	X	
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X				X					X		X			X	
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																X	
Indigofera hirsuta	Hairy indigo	X									X			X	X	X	X	
Indigofera hirsuta	Hairy indigo																	
Ipomoea hederifolia	Scarletcreeper		X															
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X	X														
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush		X															
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Leonotis nepetifolia	Lion's ear																	
Liatris gracilis	Slender goldenrod	X	X															
Lindernia crustacea	Malaysian false pimpernel	X							X						X		X	
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X															
Ludwigia octovalvis	Large seedbox	X		X													X	
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia		X		X													
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum		X															
Macroptilium lathyroides	Phaseolus	X												X			X	
Melinis repens	Natalgrass	X												X				
Melochia corchorifolia	Chocolate-weed	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine	X															X	
Mollugo verticillata	Green carpetweed																	
Muhlenbergia capillaris	Gulf muhly grass	X	X															
Murdannia nudiflora	Naked-stem dewflower					X				X								
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X												X		X	
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel	X	X														X	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T89-QN	T89-QS	T89-QE	T89-QW	T89-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add	T91-QN	T91-QS	T91-QE	T91-QW	T91-Add
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X				X											
Panicum rigidulum	Red-top panic grass	X	X															
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X				X								X				
Paspalum setaceum	Thin paspalum	X	X			X											X	
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X			X												
Phyllanthus urinaria	Chamberbitter	X							X	X	X				X		X	
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent																	
Polygonum hydropiperoides	Mild waterpepper	X	X				X											
Polygonum punctatum	Dotted smartweed	X	X		X		X											
Polypremum procumbens	Rustweed	X		X							X					X	X	
Portulaca pilosa	Pink purslane	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pterocaulon pycnostachyum	Blackroot		X															
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus laurifolia	Laurel oak		X															
Quercus minima	Dwarf live oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhododendron viscosum	Swamp azalea	X																
Rhynchospora fascicularis	Fasciculate beakrush		X															
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sacciolepis indica	Glenwood grass	X												X			X	
Sacciolepis striata	American cupscale	X	X	X	X		X											
Sagittaria lancifolia	Bulltongue arrowhead	X			X													
Sagittaria subulata	Awl-leaf arrowhead																	
Scleria ciliata var. ciliata	Fringed nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X	X					X					X				
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X	X											X				
Setaria parviflora	Knotroot bristle grass	X	X			X								X				
Sida rhombifolia	Indian hemp	X	X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T89-QN	T89-QS	T89-QE	T89-QW	T89-Add	T90-QN	T90-QS	T90-QE	T90-QW	T90-Add	T91-QN	T91-QS	T91-QE	T91-QW	T91-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod	X	X											**X**			**X**	
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X				**X**										**X**		
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X							**X**					**X**			**X**	
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X															
Vicia acutifolia	Four-leaf vetch																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
Yucca aloifolia	Spanish bayonet																	
Yucca filamentosa	Adam's needle		X															
	Totals	**78**	**107***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T92-QN	T92-QS	T92-QE	T92-QW	T92-Add	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add
Abutilon theophrasti	Velvetleaf	X		**X**														
Acalypha gracilens	Slender threeseed mercury	X	X															
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Aeschynomene americana	Meadow joint-vetch	X		**X**					**X**									
Aeschynomene indica	India joint-vetch																	
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X																
Alysicarpus vaginalis	White moneywort																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine																	
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X									**X**						
Andropogon virginicus	Broomsedge	X	X						**X**					**X**	**X**		**X**	
Aristida spiciformis	Pinebarren three-awn		X															
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw																	
Axonopus fissifolius	Southern carpet grass		X	**X**					**X**									
Axonopus furcatus	Flat-joint carpet grass		X															
Begonia cucullata	Wax begonia																	
Bidens alba (synonym B. pilosa)	White beggar-ticks		X															
Boehmeria cylindrica	Small-spike false nettle	X																
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X												**X**			**X**	
Callicarpa americana	American beauty-berry		X															
Carex longii	Long's sedge	X	X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaecrista fasciculata	Partridge-pea		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X			**X**													
Chamaesyce mendezii	Mendez's sandmat																	
Cirsium nuttallii	Nuttall's thistle	X																
Commelina diffusa	Dayflower	X																
Commelina gambiae	Gambian dayflower	X		**X**														
Conyza canadensis	Dwarf horseweed						**X**		**X**									
Coreopsis leavenworthii	Leavenworth's tickseed	X	X															
Crassocephalum crepidioides	Redflower ragleaf																	
Crotalaria pallida	Smooth rattle-box	X																
Crotalaria rotundifolia	Rabbitbells	X	X															
Crotalaria spectabilis	Rattle-box																	
Croton michauxii	Rushfoil	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T92-QN	T92-QS	T92-QE	T92-QW	T92-Add	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus flavescens	Yellow flatsedge		X															
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus odoratus	Fragrant flatsedge		X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															
Cyperus strigosus	Straw colored flatsedge		X															
Cyperus surinamensis	Tropical flatsedge		X															
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X							**X**									
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X												**X**		**X**	**X**	
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass		X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed																	
Eclipta prostrata	Upright burhead		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Emilia sonchifolia	Tasselflower	X																
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass		X															
Erechtites hieraciifolius	Fireweed	X	X															
Erigeron quercifolius	Oak-leaf fleabane		X															
Erigeron strigosus	Prairie fleabane																	
Erythrina herbacea	Coral bean		X															
Eupatorium capillifolium	Dogfennel		X	**X**							**X**	**X**						
Eupatorium mohrii	Eupatorium		X															
Eupatorium rotundifolium	False hoarhound	X	X															
Eustachys glauca	Saltmarsh fingergrass		X															
Euthamia caroliniana	Slender goldenrod		X						**X**					**X**			**X**	
Fimbristylis autumnalis	Fringe-rush	X	X						**X**		**X**							
Fimbristylis dichotoma	Forked fimbry	X																
Fimbristylis puberula	Vahl's hairy fringe-rush		X															
Fuirena pumila	Umbrella-sedge																	
Galactia elliotii	Milkpea		X												**X**			
Galium tinctorium	Bedstraw																	
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X															
Gelsemium sempervirens	Yellow jessamine		X															
Habenaria repens	Water-spider orchid		X															
Helianthemum corymbosum	Pinebarren frostweed	X	X											**X**				

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T92-QN	T92-QS	T92-QE	T92-QW	T92-Add	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum tetrapetalum	St. John's wort	X	X															
Hypoxis juncea	Yellow star grass		X															
Hyptis alata	Musky mint		X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo	X		**X**	**X**	**X**	**X**		**X**									
Indigofera hirsuta	Hairy indigo																	
Ipomoea hederifolia	Scarletcreeper		X															
Juncus effusus	Softrush		X															
Juncus marginatus	Grassleaf rush	X	X															
Juncus megacephalus	Bighead rush		X															
Juncus scirpoides	Needlepod rush		X															
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnanthes caroliniana	Carolina redroot		X															
Lachnocaulon anceps	White-head bogbutton	X	X															
Leonotis nepetifolia	Lion's ear																	
Liatris gracilis	Slender goldenrod	X	X															
Lindernia crustacea	Malaysian false pimpernel	X																
Lindernia grandiflora	False pimpernel		X															
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X	X						**X**									
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Ludwigia repens	Red-leaf ludwigia		X															
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lythrum alatum	Winged lythrum		X															
Macroptilium lathyroides	Phaseolus	X																
Melinis repens	Natalgrass	X		**X**														
Melochia corchorifolia	Chocolate-weed	X																
Melothria pendula	Creeping cucumber																	
Mikania scandens	Climbing hempvine	X																
Mollugo verticillata	Green carpetweed																	
Muhlenbergia capillaris	Gulf muhly grass	X	X															
Murdannia nudiflora	Naked-stem dewflower																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia corymbosa	Flattop mille graines	X																
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X														**X**	
Oxalis corniculata	Yellow wood sorrel	X	X															

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T92-QN	T92-QS	T92-QE	T92-QW	T92-Add	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X	X													X		
Paspalum dilatatum	Dallisgrass																	
Paspalum notatum	Bahia grass	X		X	X	X	X								X	X	X	
Paspalum setaceum	Thin paspalum	X	X												X			
Paspalum urvillei	Vaseygrass																	
Phyla nodiflora	Frog-fruit	X	X															
Phyllanthus urinaria	Chamberbitter	X		X					X									
Phytolacca americana	Common pokeweed																	
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pluchea odorata	Sweetscent																	
Polygonum hydropiperoides	Mild waterpepper	X	X															
Polygonum punctatum	Dotted smartweed	X	X						X									
Polypremum procumbens	Rustweed	X		X														
Portulaca pilosa	Pink purslane	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco		X															
Pterocaulon pycnostachyum	Blackroot		X											X				
Ptilimnium capillaceum	Bishop-weed	X	X															
Quercus laurifolia	Laurel oak		X															
Quercus minima	Dwarf live oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty		X															
Rhododendron viscosum	Swamp azalea	X																
Rhynchospora fascicularis	Fasciculate beakrush		X															
Richardia brasiliensis	Richardia	X																
Richardia grandiflora	Largeflower Mexican clover																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sacciolepis indica	Glenwood grass	X																
Sacciolepis striata	American cupscale	X	X															
Sagittaria lancifolia	Bulltongue arrowhead	X																
Sagittaria subulata	Awl-leaf arrowhead																	
Scleria ciliata var. ciliata	Fringed nutrush	X	X															
Scoparia dulcis	Licorice weed	X	X	X					X									
Serenoa repens	Saw palmetto		X											X				
Sesbania herbacea	Danglepod	X	X															
Setaria parviflora	Knotroot bristle grass	X	X						X									
Sida rhombifolia	Indian hemp	X	X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T92-QN	T92-QS	T92-QE	T92-QW	T92-Add	T93-QN	T93-QS	T93-QE	T93-QW	T93-Add	T94-QN	T94-QS	T94-QE	T94-QW	T94-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod	X	X															
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Spartina bakeri	Sand cordgrass		X															
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X		**X**					**X**									
Stillingia sylvatica	Queensdelight		X															
Striga gesnerioides	Cowpea Witchweed																	
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Thelypteris kunthii	Southern shield fern																	
Tillandsia usneoides	Spanish moss		X															
Tridax procumbens	Coatbuttons																	
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		**X**					**X**	**XX**	**X**	**X**						
Vaccinium myrsinites	Shiny blueberry		X															
Vaccinium stamineum	Deerberry		X															
Vicia acutifolia	Four-leaf vetch																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X	X															
Yucca aloifolia	Spanish bayonet																	
Yucca filamentosa	Adam's needle		X											**X**				
	Totals	**78**	**107***															

* Total number of HCPMRM List Species observed since monitoring started

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T95-QN	T95-QS	T95-QE	T95-QW	T95-Add	T96-QN	T96-QS	T96-QE	T96-QW	T96-Add
Abutilon theophrasti	Velvetleaf	X											
Acalypha gracilens	Slender threeseed mercury	X	X										
Acer rubrum	Red maple		X										
Acrostichum danaeifolium	Giant leather fern												
Aeschynomene americana	Meadow joint-vetch	X							**X**				
Aeschynomene indica	India joint-vetch												
Agalinis fasciculata	Beach False-foxglove		X										
Alysicarpus ovalifolius	False moneywort	X					**X**						
Alysicarpus vaginalis	White moneywort												
Ambrosia artemisiifolia	Common ragweed		X										
Ampelopsis arborea	Pepper-vine												
Amphicarpum muehlenbergianum	Blue maidencane		X										
Andropogon glomeratus	Bushy bluestem	X	X						**X**				
Andropogon virginicus	Broomsedge	X	X										
Aristida spiciformis	Pinebarren three-awn		X										
Aristida stricta	Wiregrass		X										
Asimina obovata	Bigflower pawpaw								**X**				
Axonopus fissifolius	Southern carpet grass		X						**X**	**X**	**X**	**X**	
Axonopus furcatus	Flat-joint carpet grass		X										
Begonia cucullata	Wax begonia												
Bidens alba (synonym B. pilosa)	White beggar-ticks		X										
Boehmeria cylindrica	Small-spike false nettle	X											
Buchnera americana	American bluehearts	X	X										
Bulbostylis barbata	Watergrass	X											
Callicarpa americana	American beauty-berry		X										
Carex longii	Long's sedge	X	X										
Centella asiatica	Asian coinwort		X										
Ceratopteris thalictroides	Watersprite												
Chamaecrista fasciculata	Partridge-pea		X										
Chamaecrista nictitans	Wild sensitive plant		X										
Chamaesyce hirta	Pillpod sandmat												
Chamaesyce hyssopifolia	Hyssopleaf sandmat	X											
Chamaesyce mendezii	Mendez's sandmat												
Cirsium nuttallii	Nuttall's thistle	X											
Commelina diffusa	Dayflower	X											
Commelina gambiae	Gambian dayflower	X											
Conyza canadensis	Dwarf horseweed								**X**				
Coreopsis leavenworthii	Leavenworth's tickseed	X	X						**X**				
Crassocephalum crepidioides	Redflower ragleaf												
Crotalaria pallida	Smooth rattle-box	X											
Crotalaria rotundifolia	Rabbitbells	X	X										
Crotalaria spectabilis	Rattle-box												
Croton michauxii	Rushfoil	X	X										

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T95-QN	T95-QS	T95-QE	T95-QW	T95-Add	T96-QN	T96-QS	T96-QE	T96-QW	T96-Add
Cuphea carthagenensis	Columbian waxweed												
Cynodon dactylon	Bermuda grass												
Cyperus croceus	Baldwin flatsedge	X	X										
Cyperus flavescens	Yellow flatsedge		X										
Cyperus lanceolatus	Epiphytic flatsedge	X											
Cyperus odoratus	Fragrant flatsedge		X										
Cyperus retrorsus	Pinebarren flatsedge	X	X										
Cyperus strigosus	Straw colored flatsedge		X										
Cyperus surinamensis	Tropical flatsedge		X										
Cyperus virens	Green flatsedge	X							**X**				
Desmodium incanum	Zarzabacao comun	X	X										
Desmodium triflorum	Beggarweed	X											
Dichanthelium aciculare	Needleleaf witchgrass		X										
Dichanthelium acuminatum	Panic grass	X							**X**		**X**	**X**	
Dichanthelium commutatum	Variable witchgrass												
Digitaria ciliaris	Southern crabgrass		X										
Digitaria longiflora	Indian crabgrass												
Digitaria serotina	Hairy crabgrass		X										
Drymaria cordata	West Indian chickweed												
Eclipta prostrata	Upright burhead		X										
Eleocharis baldwinii	Baldwin's spikerush		X										
Elephantopus elatus	Tall elephantsfoot		X										
Emilia fosbergii	Florida tasselflower												
Emilia sonchifolia	Tasselflower	X											
Eragrostis atrovirens	Thalia lovegrass												
Eragrostis elliottii	Elliot's lovegrass		X										
Erechtites hieraciifolius	Fireweed	X	X										
Erigeron quercifolius	Oak-leaf fleabane		X										
Erigeron strigosus	Prairie fleabane												
Erythrina herbacea	Coral bean		X										
Eupatorium capillifolium	Dogfennel		X						**X**				
Eupatorium mohrii	Eupatorium		X						**X**				
Eupatorium rotundifolium	False hoarhound	X	X										
Eustachys glauca	Saltmarsh fingergrass		X										
Euthamia caroliniana	Slender goldenrod		X							**X**	**X**	**X**	
Fimbristylis autumnalis	Fringe-rush	X	X										
Fimbristylis dichotoma	Forked fimbry	X											
Fimbristylis puberula	Vahl's hairy fringe-rush		X										
Fuirena pumila	Umbrella-sedge												
Galactia elliotii	Milkpea		X						**X**				
Galium tinctorium	Bedstraw												
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X										
Gelsemium sempervirens	Yellow jessamine		X										
Habenaria repens	Water-spider orchid		X										
Helianthemum corymbosum	Pinebarren frostweed	X	X										

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T95-QN	T95-QS	T95-QE	T95-QW	T95-Add	T96-QN	T96-QS	T96-QE	T96-QW	T96-Add
Helianthus angustifolius	Narrowleaf sunflower	X	X										
Hydrocotyle umbellata	Manyflower marshpennywort		X										
Hypericum cistifolium	Round-pod St. John's wort		X										
Hypericum fasciculatum	Sand-weed St. John's-wort												
Hypericum tetrapetalum	St. John's wort	X	X						X				
Hypoxis juncea	Yellow star grass		X										
Hyptis alata	Musky mint		X										
Hyptis verticillata	John Charles												
Imperata cylindrica	Cogon grass												
Indigofera hirsuta	Hairy indigo	X			X								
Indigofera hirsuta	Hairy indigo												
Ipomoea hederifolia	Scarletcreeper		X										
Juncus effusus	Softrush		X										
Juncus marginatus	Grassleaf rush	X	X										
Juncus megacephalus	Bighead rush		X										
Juncus scirpoides	Needlepod rush		X										
Kyllinga brevifolia	Shortleaf spikesedge	X											
Lachnanthes caroliniana	Carolina redroot		X										
Lachnocaulon anceps	White-head bogbutton	X	X										
Leonotis nepetifolia	Lion's ear												
Liatris gracilis	Slender goldenrod	X	X										
Lindernia crustacea	Malaysian false pimpernel	X											
Lindernia grandiflora	False pimpernel		X										
Liquidambar styraciflua	Sweetgum		X										
Ludwigia maritima	Seaside primrosewillow	X	X										
Ludwigia octovalvis	Large seedbox	X											
Ludwigia peruviana	Primrose willow	X											
Ludwigia repens	Red-leaf ludwigia		X										
Luziola fluitans	Southern watergrass												
Lycopodiella cernua	Nodding clubmoss												
Lygodium japonicum	Japanese climbing fern												
Lythrum alatum	Winged lythrum		X										
Macroptilium lathyroides	Phaseolus	X											
Melinis repens	Natalgrass	X											
Melochia corchorifolia	Chocolate-weed	X											
Melothria pendula	Creeping cucumber												
Mikania scandens	Climbing hempvine	X											
Mollugo verticillata	Green carpetweed												
Muhlenbergia capillaris	Gulf muhly grass	X	X										
Murdannia nudiflora	Naked-stem dewflower												
Nephrolepis exaltata	Boston fern												
Oldenlandia corymbosa	Flattop mille graines	X											
Oldenlandia uniflora	Clustered millie graines		X										
Opuntia humifusa	Pricklypear		X										
Oxalis corniculata	Yellow wood sorrel	X	X										

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T95-QN	T95-QS	T95-QE	T95-QW	T95-Add	T96-QN	T96-QS	T96-QE	T96-QW	T96-Add
Panicum anceps	Beaked panic grass		X										
Panicum dichotomiflorum	Fall panicum												
Panicum hemitomon	Maidencane		X										
Panicum rigidulum	Red-top panic grass	X	X										
Paspalum dilatatum	Dallisgrass												
Paspalum notatum	Bahia grass	X					**X**						
Paspalum setaceum	Thin paspalum	X	X										
Paspalum urvillei	Vaseygrass												
Phyla nodiflora	Frog-fruit	X	X										
Phyllanthus urinaria	Chamberbitter	X											
Phytolacca americana	Common pokeweed												
Piloblephis rigida	Wild pennyroyal		X										
Pityopsis graminifolia	Narrowleaf silkgrass	X	X										
Pluchea odorata	Sweetscent												
Polygonum hydropiperoides	Mild waterpepper	X	X										
Polygonum punctatum	Dotted smartweed	X	X										
Polypremum procumbens	Rustweed	X											
Portulaca pilosa	Pink purslane	X											
Pouzolzia zeylanica	Pouzolz's bush												
Praxelis clematidea	Praxelis	X											
Pseudognaphalium obtusifolium	Rabbit tobacco		X										
Pterocaulon pycnostachyum	Blackroot		X										
Ptilimnium capillaceum	Bishop-weed	X	X										
Quercus laurifolia	Laurel oak		X										
Quercus minima	Dwarf live oak		X										
Quercus virginiana	Live oak		X										
Rhexia mariana	Meadow-beauty		X										
Rhododendron viscosum	Swamp azalea	X										**X**	
Rhynchospora fascicularis	Fasciculate beakrush		X										
Richardia brasiliensis	Richardia	X											
Richardia grandiflora	Largeflower Mexican clover												
Rubus pensilvanicus	Sawtooth blackberry												
Sabal palmetto	Cabbage palm												
Sacciolepis indica	Glenwood grass	X											
Sacciolepis striata	American cupscale	X	X										
Sagittaria lancifolia	Bulltongue arrowhead	X											
Sagittaria subulata	Awl-leaf arrowhead												
Scleria ciliata var. ciliata	Fringed nutrush	X	X										
Scoparia dulcis	Licorice weed	X	X						**X**				
Serenoa repens	Saw palmetto		X						**X**				
Sesbania herbacea	Danglepod	X	X										
Setaria parviflora	Knotroot bristle grass	X	X										
Sida rhombifolia	Indian hemp	X	X										
Smilax auriculata	Earleaf greenbriar		X										
Smilax bona-nox	Saw greenbrier									**X**		**X**	

TABLE 102: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T95-QN	T95-QS	T95-QE	T95-QW	T95-Add	T96-QN	T96-QS	T96-QE	T96-QW	T96-Add
Solanum viarum	Tropical soda apple												
Solidago fistulosa	Pine-barren goldenrod	X	X										
Solidago fistulosa	Pine-barren goldenrod		X										
Solidago sempervirens	Seaside goldenrod												
Spartina bakeri	Sand cordgrass		X										
Spermacoce remota	Woodland false buttonweed												
Spermacoce verticillata	Shrubby false buttonweed	X											
Sphagnum sp.	Moss												
Sporobolus indicus	Smutgrass	X											
Stillingia sylvatica	Queensdelight		X										
Striga gesnerioides	Cowpea Witchweed												
Symphyotrichum bahamense	Annual saltmarsh aster	X											
Thelypteris kunthii	Southern shield fern												
Tillandsia usneoides	Spanish moss		X										
Tridax procumbens	Coatbuttons												
Typha sp.	Cattail												
Urena lobata	Caesarweed	X									**X**		
Vaccinium myrsinites	Shiny blueberry		X										
Vaccinium stamineum	Deerberry		X										
Vicia acutifolia	Four-leaf vetch												
Woodwardia virginica	Virginia chain fern								**X**				
Xyris sp.	Yellow-eyed grass	X	X										
Yucca aloifolia	Spanish bayonet												
Yucca filamentosa	Adam's needle		X										
Totals		**78**	**107***										

* Total number of HCPMRM List Species observed since monitoring started

TABLE 103: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T74-QN	T74-QS	T74-QE	T74-QW	T74-Add	T75-QN	T75-QS	T75-QE	T75-QW	T75-Add	T76-QN	T76-QS	T76-QE	T76-QW	T76-Add
Amphicarpum muehlenbergianum	Blue maidencane		X															
Andropogon glomeratus	Bushy bluestem	X	X						X									
Andropogon virginicus	Broomsedge	X	X		X				X						X			
Aristida spiciformis	Pinebarren three-awn	X	X															
Aristida stricta	Wiregrass		X															
Axonopus furcatus	Flat-joint carpet grass	X	X											X				
Bulbostylis barbata	Watergrass																	
Carex longii	Long's sedge	X	X						X									
Centella asiatica	Asian coinwort		X															
Chamaecrista nictitans	Wild sensitive plant		X															
Cirsium horridulum	Thistle																	
Commelina gambiae	Gambian dayflower																	
Coreopsis leavenworthii	Leavenworth's tickseed	X	X	X										X				
Crotalaria rotundifolia	Rabbitbells	X	X												X			
Cyperus croceus	Baldwin flatsedge	X	X		X													
Cyperus retrorsus	Pinebarren flatsedge	X	X	X										X	X	X	X	
Cyperus strigosus	Straw colored flatsedge	X	X													X		
Desmodium triflorum	Beggarweed	X		X													X	
Dichanthelium acuminatum	Panic grass	X		X					X					X			X	
Elephantopus elatus	Tall elephantsfoot	X	X	X					X									
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eryingium yuccifolium	Rattlesnake master		X															
Eupatorium capillifolium	Dogfennel		X	X														
Eupatorium mohrii	Eupatorium	X	X															
Euthamia caroliniana	Slender goldenrod		X	X		X			X					X	X	X	X	
Galactia elliotii	Milkpea		X	X										X				
Gamochaeta pensylvanica	Pennsylvania everlasting	X	X	X										X				
Gelsemium sempervirens	Yellow jessamine		X															
Helenium amarum	Spanish daisy		X															
Dichanthelium aciculare	Needleleaf witchgrass		X															
Helianthus angustifolius	Narrowleaf sunflower		X								X							
Hydrocotyle umbellata	Manyflower marshpennywort		X		X													
Hypericum cistifolium	Round-pod St. John's wort	X	X						X									
Hypericum tetrapetalum	St. John's wort		X															
Hyptis alata	Musky mint	X	X						X									
Hyptis verticillata	John Charles			X														
Imperata cylindrica	Cogon grass	X																
Indigofera hirsuta	Hairy indigo	X		X										X			X	
Juncus marginatus	Grassleaf rush	X	X															
Juncus scirpoides	Needlepod rush	X	X						X									
Lachnanthes caroliniana	Carolina redroot	X	X						X									
Lachnocaulon anceps	White-head bogbutton	X	X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X												X				
Ludwigia maritima	Seaside primrosewillow	X	X															

X = occurence within the quadrat

TABLE 103: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T74-QN	T74-QS	T74-QE	T74-QW	T74-Add	T75-QN	T75-QS	T75-QE	T75-QW	T75-Add	T76-QN	T76-QS	T76-QE	T76-QW	T76-Add
Melinis repens	Natalgrass																	
Myrica cerifera	Wax myrtle		X								X							
Oldenlandia uniflora	Clustered millie graines		X															
Osmunda cinnamomea	Cinnamon fern	X							X	X	X	X						
Osmunda regalis	Royal fern								X									
Oxalis corniculata	Yellow wood sorrel		X															
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X	X	X	X								X				
Panicum rigidulum	Red-top panic grass	X	X															
Paspalum notatum	Bahia grass	X		X	X	X	X		X					X		X	X	
Paspalum setaceum	Thin paspalum	X	X		X									X				
Phyla nodiflora	Frog-fruit		X															
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X	X										X				
Pluchea baccharis	Rosy camphorweed	X							X									
Polypremum procumbens	Rustweed	X		X														
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X	X	X									X				
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X	X	X					X					X				
Rhus copallinum	Winged sumac		X															
Rhynchospora fascicularis	Fasciculate beakrush	X	X						X									
Rhynchospora microcarpa	Southern beakrush	X																
Rubus argutus	Sawtooth blackberry		X															
Sacciolepis indica	Glenwood grass	X							X									
Scoparia dulcis	Licorice weed	X	X			X												
Serenoa repens	Saw palmetto		X															
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier			X	X		X							X				
Solidago fistulosa	Pine-barren goldenrod		X						X			X						
Solidago odorata var. chapmanii	Chapman's goldenrod		X															
Stillingia sylvatica	Queensdelight		X															
Symphyotrichum bahamense	Annual saltmarsh aster	X																
Syngonanthus flavidulus	Bantam-buttons		X															
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy				X													
Tripsacum dactyloides	Fakahatchee grass								X									
Urena lobata	Caesarweed	X			X				X					X				
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X															
Vitis rotundifolia	Muscadine grape		X							X								
Woodwardia virginica	Virginia chain fern								X									
Xyris caroliniana	Carolina yelloweyed grass	X	X															
Xyris sp.	Yellow-eyed grass	X	X						X	X		X						
Yucca filamentosa	Adam's needle		X															
	Totals	**41**	**66***															

* Total number of HCPMRM List Species observed since monitoring started

X = occurence within the quadrat

TABLE 104: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T70-QN	T70-QS	T70-QE	T70-QW	T70-Add	T71-QN	T71-QS	T71-QE	T71-QW	T71-Add	T72-QN	T72-QS	T72-QE	T72-QW	T72-Add
Andropogon glomeratus	Bushy bluestem	X	X						X									
Andropogon ternarius	Splitbeard bluestem	X	X		X				X	X	X	X						
Andropogon virginicus	Broomsedge	X	X											X		X		
Aristida spiciformis	Pinebarren three-awn	X	X						X									
Aristida stricta	Wiregrass		X													X		
Asimina obovata	Bigflower pawpaw																	
Axonopus furcatus	Flat-joint carpet grass		X															
Baccharis halimifolia	Eastern false-willow		X															
Callicarpa americana	American beauty-berry		X															
Carphephorus odoratissimus	Pineland purple																	
Centella asiatica	Asian coinwort		X															
Crotalaria rotundifolia	Rabbitbells		X															
Crotalaria spectabilis	Rattle-box																	
Cyperus retrorsus	Pinebarren flatsedge	X	X							X	X							
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X								X	X							
Dichanthelium commutatum	Variable witchgrass																	
Dichanthelium ensifolium	Cypress witchgrass		X															
Drosera capillaris	Dwarf sundew		X															
Eleocharis baldwinii	Baldwin's spikerush		X															
Elephantopus elatus	Tall elephantsfoot	X	X											X				
Emilia fosbergii	Florida tasselflower																	
Eragrostis elliottii	Elliot's lovegrass	X	X						X									
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Erigeron quercifolius	Oak-leaf fleabane	X	X											X				
Eriocaulon decangulare	Ten-angle pipewort																	
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium	X	X															
Eupatorium rotundifolium	False hoarhound		X															
Euthamia caroliniana	Slender goldenrod		X							X	X	X						
Fimbristylis dichotoma	Forked fimbry																	
Galactia elliotii	Milkpea		X															
Gelsemium sempervirens	Yellow jessamine		X															
Helianthus angustifolius	Narrowleaf sunflower	X	X															
Hypericum cistifolium	Round-pod St. John's wort	X	X											X				
Hypericum cistifolium	Round-pod St. John's wort		X															
Hypericum gentianoides	Pineweeds		X															
Hypericum tetrapetalum	St. John's wort	X	X						X					X				
Hypoxis curtissii	Common yellow star grass																	
Hypoxis juncea	Yellow star grass	X	X															
Hyptis alata	Musky mint	X	X															
Ilex glabra	Gallberry		X											X				
Ilex glabra	Gallberry		X															
Juncus marginatus	Grassleaf rush		X															

x = occurence within the quadrat

TABLE 104: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T70-QN	T70-QS	T70-QE	T70-QW	T70-Add	T71-QN	T71-QS	T71-QE	T71-QW	T71-Add	T72-QN	T72-QS	T72-QE	T72-QW	T72-Add
Juncus megacephalus	Bighead rush	X	X															
Juncus scirpoides	Needlepod rush	X	X															
Lachnanthes caroliniana	Carolina redroot	X	X															
Lachnocaulon anceps	White-head bogbutton	X	X						X		X	X						
Lechea deckertii	Deckert's pinweed																	
Liatris gracilis	Slender goldenrod	X	X											X				
Licania michauxii	Gopher apple		X															
Ludwigia maritima	Seaside primrosewillow		X						X									
Ludwigia repens	Red-leaf ludwigia		X															
Lyonia fruticosa	Coastplain Staggerbush		X															
Lyonia lucida	Fetterbush		X															
Mikania scandens	Climbing hempvine																	
Mimosa strigillosa	Mimosa																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Osmunda cinnamomea	Cinnamon fern													X				
Osmunda regalis	Royal fern													X		X	X	
Panicum anceps	Beaked panic grass		X															
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X	X						X	X	X	X		X				
Persea borbonia	Red bay													X				
Persea borbonia	Red bay																	
Phytolacca americana	Common pokeweed																	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Polygonum punctatum	Dotted smartweed		X															
Pteridium aquilinum	Bracken fern		X															
Pterocaulon pycnostachyum	Blackroot		X															
Quercus virginiana	Live oak		X	X		X												
Rhexia mariana	Meadow-beauty		X															
Rhus copallinum	Winged sumac		X															
Rhynchospora baldwinii	Baldwin's beakrush																	
Rhynchospora fascicularis	Fasciculate beakrush	X	X						X									
Rhynchospora fernaldii	Fernald's beakrush		X															
Rubus argutus	Sawtooth blackberry		X															
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																
Schizachyrium stoloniferum	Creeping little bluestem													X				
Scleria ciliata var. ciliata	Fringed nutrush		X															
Scleria reticularis	Nutrush		X															
Scoparia dulcis	Licorice weed	X	X						X									
Scrophulariaceae	Scrophularia		X															
Serenoa repens	Saw palmetto		X	X	X	X	X		X									
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																X	

x = occurence within the quadrat

TABLE 104: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T70-QN	T70-QS	T70-QE	T70-QW	T70-Add	T71-QN	T71-QS	T71-QE	T71-QW	T71-Add	T72-QN	T72-QS	T72-QE	T72-QW	T72-Add
Solanum viarum	Tropical soda apple																	
Solidago fistulosa	Pine-barren goldenrod		X						**X**					**X**				
Sorghastrum secundum	lopsided Indiangrass		X															
Stylisma patens	Coastalplain dawnflower																	
Syngonanthus flavidulus	Bantam-buttons	X	X															
Tillandsia usneoides	Spanish moss		X															
Tripsacum dactyloides	Fakahatchee grass																	
Urena lobata	Caesarweed								**X**									
Vaccinium darrowii	Darrow's blueberry																	
Vaccinium myrsinites	Shiny blueberry	X	X															
Verbesina encelioides	Skunk Daisy																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape		X								**X**				**X**		**X**	
Woodwardia virginica	Virginia chain fern										**X**							
Xyris sp.	Yellow-eyed grass	X	X								**X**			**X**				
Zephyranthes atamasca var. atamasca	Rainlily		X															
	Totals	**28**	**75***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within the quadrat

TABLE 104: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T73-QN	T73-QS	T73-QE	T73-QW	T73-Add
Andropogon glomeratus	Bushy bluestem	X	X					
Andropogon ternarius	Splitbeard bluestem	X	X					
Andropogon virginicus	Broomsedge	X	X	**X**				
Aristida spiciformis	Pinebarren three-awn	X	X					
Aristida stricta	Wiregrass		X	**X**		**X**		
Asimina obovata	Bigflower pawpaw							
Axonopus furcatus	Flat-joint carpet grass		X					
Baccharis halimifolia	Eastern false-willow		X					
Callicarpa americana	American beauty-berry		X					
Carphephorus odoratissimus	Pineland purple							
Centella asiatica	Asian coinwort		X					
Crotalaria rotundifolia	Rabbitbells		X					
Crotalaria spectabilis	Rattle-box						**X**	
Cyperus retrorsus	Pinebarren flatsedge	X	X					
Dichanthelium aciculare	Needleleaf witchgrass		X					
Dichanthelium acuminatum	Panic grass	X						
Dichanthelium commutatum	Variable witchgrass							
Dichanthelium ensifolium	Cypress witchgrass		X					
Drosera capillaris	Dwarf sundew		X					
Eleocharis baldwinii	Baldwin's spikerush		X					
Elephantopus elatus	Tall elephantsfoot	X	X					
Emilia fosbergii	Florida tasselflower							
Eragrostis elliottii	Elliot's lovegrass	X	X	**X**				
Eragrostis spectabilis	Purple lovegrass		X					
Erechtites hieraciifolius	Fireweed		X					
Erigeron quercifolius	Oak-leaf fleabane	X	X					
Eriocaulon decangulare	Ten-angle pipewort			**X**				
Eupatorium capillifolium	Dogfennel		X					
Eupatorium mohrii	Eupatorium	X	X					
Eupatorium rotundifolium	False hoarhound		X					
Euthamia caroliniana	Slender goldenrod		X	**X**				
Fimbristylis dichotoma	Forked fimbry							
Galactia elliotii	Milkpea		X					
Gelsemium sempervirens	Yellow jessamine		X		**X**		**X**	
Helianthus angustifolius	Narrowleaf sunflower	X	X					
Hypericum cistifolium	Round-pod St. John's wort	X	X	**X**				
Hypericum cistifolium	Round-pod St. John's wort		X					
Hypericum gentianoides	Pineweeds		X					
Hypericum tetrapetalum	St. John's wort	X	X	**X**				
Hypoxis curtissii	Common yellow star grass							
Hypoxis juncea	Yellow star grass	X	X					
Hyptis alata	Musky mint	X	X					
Ilex glabra	Gallberry		X		**X**			
Ilex glabra	Gallberry		X					
Juncus marginatus	Grassleaf rush		X					

x = occurence within the quadrat

TABLE 104: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T73-QN	T73-QS	T73-QE	T73-QW	T73-Add
Juncus megacephalus	Bighead rush	X	X	**X**				
Juncus scirpoides	Needlepod rush	X	X	**X**				
Lachnanthes caroliniana	Carolina redroot	X	X					
Lachnocaulon anceps	White-head bogbutton	X	X					
Lechea deckertii	Deckert's pinweed							
Liatris gracilis	Slender goldenrod	X	X			**X**		
Licania michauxii	Gopher apple		X					
Ludwigia maritima	Seaside primrosewillow		X					
Ludwigia repens	Red-leaf ludwigia		X					
Lyonia fruticosa	Coastplain Staggerbush		X					
Lyonia lucida	Fetterbush		X					
Mikania scandens	Climbing hempvine							
Mimosa strigillosa	Mimosa							
Myrica cerifera	Wax myrtle		X					
Nephrolepis exaltata	Boston fern							
Osmunda cinnamomea	Cinnamon fern							
Osmunda regalis	Royal fern							
Panicum anceps	Beaked panic grass		X					
Panicum hemitomon	Maidencane		X					
Panicum rigidulum	Red-top panic grass	X	X					
Persea borbonia	Red bay							
Persea borbonia	Red bay							
Phytolacca americana	Common pokeweed							
Pityopsis graminifolia	Narrowleaf silkgrass	X	X	**X**				
Pityopsis graminifolia	Narrowleaf silkgrass		X					
Polygonum punctatum	Dotted smartweed		X					
Pteridium aquilinum	Bracken fern		X					
Pterocaulon pycnostachyum	Blackroot		X					
Quercus virginiana	Live oak		X					
Rhexia mariana	Meadow-beauty		X					
Rhus copallinum	Winged sumac		X					
Rhynchospora baldwinii	Baldwin's beakrush							
Rhynchospora fascicularis	Fasciculate beakrush	X	X			**X**		
Rhynchospora fernaldii	Fernald's beakrush		X					
Rubus argutus	Sawtooth blackberry		X					
Rubus pensilvanicus	Sawtooth blackberry							
Sacciolepis indica	Glenwood grass	X						
Schizachyrium stoloniferum	Creeping little bluestem				**X**	**X**	**X**	
Scleria ciliata var. ciliata	Fringed nutrush		X					
Scleria reticularis	Nutrush		X					
Scoparia dulcis	Licorice weed	X	X					
Scrophulariaceae	Scrophularia		X					
Serenoa repens	Saw palmetto		X					
Smilax auriculata	Earleaf greenbriar		X	**X**				
Smilax bona-nox	Saw greenbrier						**X**	

x = occurence within the quadrat

TABLE 104: HERBACEOUS INVENTORY MATRIX - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T73-QN	T73-QS	T73-QE	T73-QW	T73-Add
Solanum viarum	Tropical soda apple							
Solidago fistulosa	Pine-barren goldenrod		X					
Sorghastrum secundum	lopsided Indiangrass		X					
Stylisma patens	Coastalplain dawnflower							
Syngonanthus flavidulus	Bantam-buttons	X	X					
Tillandsia usneoides	Spanish moss		X	**X**				
Tripsacum dactyloides	Fakahatchee grass							
Urena lobata	Caesarweed							
Vaccinium darrowii	Darrow's blueberry							
Vaccinium myrsinites	Shiny blueberry	X	X					
Verbesina encelioides	Skunk Daisy							
Vicia acutifolia	Four-leaf vetch							
Vitis rotundifolia	Muscadine grape		X	**X**				
Woodwardia virginica	Virginia chain fern							
Xyris sp.	Yellow-eyed grass	X	X					
Zephyranthes atamasca var. atamasca	Rainlily		X					
	Totals	**28**	**75***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X								X								X
Agalinis fasciculata	Beach False-foxglove																	
Alysicarpus ovalifolius	False moneywort	X							X	X								
Ambrosia artemisiifolia	Common ragweed		X															
Ammannia latifolia	Pink redstem																	
Andropogon glomeratus	Bushy bluestem	X			X	X					X							X
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass																	
Asclepias curassavica	Scarlet milkweed												X					
Axonopus fissifolius	Southern carpet grass																	
Axonopus furcatus	Flat-joint carpet grass																	
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X									X			X			
Boehmeria cylindrica	Small-spike false nettle	X											X		X		X	
Bulbostylis barbata	Watergrass	X											X					
Carex longii	Long's sedge		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat																	
Chamaesyce prostrata	Prostrate sandmat																	
Chamaecrista nictitans	Wild sensitive plant		X															
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X	X				X											
Commelina gambiae	Gambian dayflower																	
Conyza canadensis	Dwarf horseweed																	
Coreopsis leavenworthii	Leavenworth's tickseed	X																
Crotalaria pallida	Smooth rattle-box																	
Crotalaria rotundifolia	Rabbitbells																	
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus alopecuroides	Foxtail flatsedge	X		X														
Cyperus compressus	Poorland flatsedge	X											X					
Cyperus croceus	Baldwin flatsedge		X															
Cyperus flavescens	Yellow flatsedge																	
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge	X															X	
Cyperus ligularis	Swamp flatsedge	X																
Cyperus odoratus	Fragrant flatsedge	X																X
Cyperus strigosus	Straw colored flatsedge																	
Cyperus surinamensis	Tropical flatsedge																	
Desmodium triflorum	Beggarweed																	
Dichanthelium acuminatum	Panic grass																	

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X										X					
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed																	
Drymaria cordata	West Indian chickweed		X															
Eclipta prostrata	Upright burhead	X																
Eleocharis interstincta	Knotted spikerush																	
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X										X					
Eupatorium capillifolium	Dogfennel		X								X			X			X	
Eupatorium serotinum	Late-flowering thorough-wort																	
Euthamia caroliniana	Slender goldenrod												X					
Fimbristylis dichotoma	Forked fimbry																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine		X															
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X	X	X	X	X											X
Hymenachne amplexicaulis	Trompetilla	X																X
Hypericum tetrapetalum	St. John's wort																	
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass	X																X
Indigofera hirsuta	Hairy indigo	X									X							
Ipomoea triloba	Littlebell																	
Juncus marginatus	Grassleaf rush																	
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush																	
Kyllinga brevifolia	Shortleaf spikesedge	X						X										
Lactuca graminifolia	Grassleaf lettuce																	
Lindernia crustacea	Malaysian false pimpernel	X																X
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X											X					
Ludwigia octovalvis	Large seedbox	X												X	X		X	
Ludwigia peruviana	Primrose willow							X										
Ludwigia repens	Red-leaf ludwigia							X										
Lygodium japonicum	Japanese climbing fern																	
Lygodium microphyllum	Small-leaf climbing fern																	
Lythrum alatum	Winged lythrum	X																
Myrica cerifera	Wax myrtle		X				X											
Melochia corchorifolia	Chocolate-weed	X						X										
Melinis repens	Natalgrass	X										X						

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Mikania scandens	Climbing hempvine	X						X						X	X	X	X	
Mollugo verticillata	Green carpetweed																	
Murdannia nudiflora	Naked-stem dewflower																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines		X															
Oxalis corniculata	Yellow wood sorrel		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum repens	Torpedo grass			X														
Paspalum dilatatum	Dallisgrass	X																
Paspalum notatum	Bahia grass	X							X	X								
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Physalis angulata	Cutleaf ground cherry																	
Phyla nodiflora	Frog-fruit																	
Phyllanthus urinaria	Chamberbitter																	
Pityopsis graminifolia	Narrowleaf silkgrass																	
Polygonum punctatum	Dotted smartweed	X		X														X
Polypremum procumbens	Rustweed	X																
Praxelis clematidea	Praxelis	X																
Pseudognaphalium obtusifolium	Rabbit tobacco																	
Pterocaulon pycnostachyum	Blackroot																	
Rhexia mariana	Meadow-beauty																	
Richardia brasiliensis	Richardia	X											X					
Ricinus communis	Castor bean	X											X					
Rubus pensilvanicus	Sawtooth blackberry																	
Sacciolepis indica	Glenwood grass	X																X
Sagittaria lancifolia	Bulltongue arrowhead	X						X										
Salix caroliniana	Southern willow																	
Schoenoplectus tabernaemontani	Softstem bulrush							X					X					
Scleria baldwinii	Baldwin's nutrush																	
Scoparia dulcis	Licorice weed	X	X								X							
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X						X										
Setaria parviflora	Knotroot bristle grass	X						X		X	X	X					X	
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier		X															
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod	X				X	X											
Solanum viarum	Tropical soda apple												X					
Spartina bakeri	Sand cordgrass																	
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster	X																X

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T14-QN	T14-QS	T14-QE	T14-QW	T14-Add	T15-QN	T15-QS	T15-QE	T15-QW	T15-Add	T16-QN	T16-QS	T16-QE	T16-QW	T16-Add
Thelypteris kunthii	Southern shield fern		X															
Typha sp.	Cattail			**X**														
Urena lobata	Caesarweed	X						**X**	**X**	**X**		**X**						**X**
Urochloa distachya	Tropical signal grass																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass																	
Yucca filamentosa	Adam's needle																	
Totals		**47**	**33***															

***** Total number of HCPMRM List Species observed since monitoring started

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Acalypha gracilens	Slender threeseed mercury		X															
Aeschynomene americana	Meadow joint-vetch	X								X	X	X		X	X		X	
Agalinis fasciculata	Beach False-foxglove																	
Alysicarpus ovalifolius	False moneywort	X		X	X	X	X							X	X	X	X	
Ambrosia artemisiifolia	Common ragweed		X															
Ammannia latifolia	Pink redstem																	
Andropogon glomeratus	Bushy bluestem	X																
Andropogon virginicus	Broomsedge	X	X															
Aristida stricta	Wiregrass																	
Asclepias curassavica	Scarlet milkweed																	
Axonopus fissifolius	Southern carpet grass																	
Axonopus furcatus	Flat-joint carpet grass																	
Baccharis halimifolia	Eastern false-willow		X															
Berlandiera subacaulis	Florida greeneyes																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X	X		X	X		X	X				X			X	
Boehmeria cylindrica	Small-spike false nettle	X																
Bulbostylis barbata	Watergrass	X																
Carex longii	Long's sedge		X															
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat																	
Chamaesyce prostrata	Prostrate sandmat																	
Chamaecrista nictitans	Wild sensitive plant		X															
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X	X															
Commelina gambiae	Gambian dayflower																	
Conyza canadensis	Dwarf horseweed								X	X								
Coreopsis leavenworthii	Leavenworth's tickseed	X											X					
Crotalaria pallida	Smooth rattle-box												X					
Crotalaria rotundifolia	Rabbitbells																	
Cuphea carthagenensis	Columbian waxweed																	
Cynodon dactylon	Bermuda grass	X																
Cyperus alopecuroides	Foxtail flatsedge	X																
Cyperus compressus	Poorland flatsedge	X																
Cyperus croceus	Baldwin flatsedge		X															
Cyperus flavescens	Yellow flatsedge																	
Cyperus iria	Rice flatsedge																	
Cyperus lanceolatus	Epiphytic flatsedge	X																
Cyperus ligularis	Swamp flatsedge	X																
Cyperus odoratus	Fragrant flatsedge	X																
Cyperus strigosus	Straw colored flatsedge																	
Cyperus surinamensis	Tropical flatsedge																	
Desmodium triflorum	Beggarweed																	
Dichanthelium acuminatum	Panic grass																	

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Diodia virginiana	Rough button-weed																	
Drymaria cordata	West Indian chickweed		X															
Eclipta prostrata	Upright burhead	X																
Eleocharis interstincta	Knotted spikerush																	
Eragrostis atrovirens	Thalia lovegrass																	
Eragrostis elliottii	Elliot's lovegrass	X	X															
Eragrostis spectabilis	Purple lovegrass		X															
Erechtites hieraciifolius	Fireweed		X															
Eupatorium capillifolium	Dogfennel		X					X	X		X	X						
Eupatorium serotinum	Late-flowering thorough-wort																	
Euthamia caroliniana	Slender goldenrod																	
Fimbristylis dichotoma	Forked fimbry																	
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting		X															
Gelsemium sempervirens	Yellow jessamine		X															
Heterotheca subaxillaris	Camphorweed																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hymenachne amplexicaulis	Trompetilla	X																
Hypericum tetrapetalum	St. John's wort																	
Hyptis verticillata	John Charles								X	X	X	X						
Imperata cylindrica	Cogon grass	X																
Indigofera hirsuta	Hairy indigo	X			X													
Ipomoea triloba	Littlebell																	
Juncus marginatus	Grassleaf rush																	
Juncus megacephalus	Bighead rush																	
Juncus scirpoides	Needlepod rush																	
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lactuca graminifolia	Grassleaf lettuce																	
Lindernia crustacea	Malaysian false pimpernel	X																
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow	X																
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow																	
Ludwigia repens	Red-leaf ludwigia																	
Lygodium japonicum	Japanese climbing fern																	
Lygodium microphyllum	Small-leaf climbing fern																	
Lythrum alatum	Winged lythrum	X																
Myrica cerifera	Wax myrtle		X															
Melochia corchorifolia	Chocolate-weed	X																
Melinis repens	Natalgrass	X			X		X											

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Mikania scandens	Climbing hempvine	X																
Mollugo verticillata	Green carpetweed																	
Murdannia nudiflora	Naked-stem dewflower																	
Nephrolepis exaltata	Boston fern																	
Oldenlandia uniflora	Clustered millie graines		X															
Oxalis corniculata	Yellow wood sorrel		X															
Panicum dichotomiflorum	Fall panicum																	
Panicum hemitomon	Maidencane		X															
Panicum repens	Torpedo grass																	
Paspalum dilatatum	Dallisgrass	X												X				
Paspalum notatum	Bahia grass	X						X		X	X							
Paspalum setaceum	Thin paspalum		X															
Paspalum urvillei	Vaseygrass	X																
Physalis angulata	Cutleaf ground cherry												X					
Phyla nodiflora	Frog-fruit																	
Phyllanthus urinaria	Chamberbitter																	
Pityopsis graminifolia	Narrowleaf silkgrass																	
Polygonum punctatum	Dotted smartweed	X																
Polypremum procumbens	Rustweed	X																X
Praxelis clematidea	Praxelis	X						X		X								
Pseudognaphalium obtusifolium	Rabbit tobacco												X					
Pterocaulon pycnostachyum	Blackroot																	
Rhexia mariana	Meadow-beauty																	
Richardia brasiliensis	Richardia	X																
Ricinus communis	Castor bean	X																
Rubus pensilvanicus	Sawtooth blackberry						X											
Sacciolepis indica	Glenwood grass	X																
Sagittaria lancifolia	Bulltongue arrowhead	X																
Salix caroliniana	Southern willow																	
Schoenoplectus tabernaemontani	Softstem bulrush																	
Scleria baldwinii	Baldwin's nutrush																	
Scoparia dulcis	Licorice weed	X	X		X						X	X						
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X																
Setaria parviflora	Knotroot bristle grass	X																
Sida cordifolia	Llima																	
Sida rhombifolia	Indian hemp		X															
Smilax bona-nox	Saw greenbrier		X															
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod	X																
Solanum viarum	Tropical soda apple												X					X
Spartina bakeri	Sand cordgrass																	
Spermacoce remota	Woodland false buttonweed																	
Spermacoce verticillata	Shrubby false buttonweed	X																
Sporobolus indicus	Smutgrass	X																
Symphyotrichum bahamense	Annual saltmarsh aster	X																

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T17-QN	T17-QS	T17-QE	T17-QW	T17-Add	T18-QN	T18-QS	T18-QE	T18-QW	T18-Add	T19-QN	T19-QS	T19-QE	T19-QW	T19-Add
Thelypteris kunthii	Southern shield fern		X															
Typha sp.	Cattail																	
Urena lobata	Caesarweed	X		X	X	X	X		X			X		X	X		X	
Urochloa distachya	Tropical signal grass																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass																	
Yucca filamentosa	Adam's needle																	
Totals		**47**	**33***															

***** Total number of HCPMRM List Species observed since monitoring started

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add
Acalypha gracilens	Slender threeseed mercury		X					
Aeschynomene americana	Meadow joint-vetch	X		**X**	**X**			
Agalinis fasciculata	Beach False-foxglove							
Alysicarpus ovalifolius	False moneywort	X						
Ambrosia artemisiifolia	Common ragweed		X					
Ammannia latifolia	Pink redstem							
Andropogon glomeratus	Bushy bluestem	X						
Andropogon virginicus	Broomsedge	X	X					
Aristida stricta	Wiregrass							
Asclepias curassavica	Scarlet milkweed							
Axonopus fissifolius	Southern carpet grass							
Axonopus furcatus	Flat-joint carpet grass							
Baccharis halimifolia	Eastern false-willow		X					
Berlandiera subacaulis	Florida greeneyes							
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X					**X**
Boehmeria cylindrica	Small-spike false nettle	X						
Bulbostylis barbata	Watergrass	X						**X**
Carex longii	Long's sedge		X					
Centella asiatica	Asian coinwort		X					
Ceratopteris thalictroides	Watersprite							
Chamaesyce hirta	Pillpod sandmat							
Chamaesyce hyssopifolia	Hyssopleaf sandmat							
Chamaesyce prostrata	Prostrate sandmat							
Chamaecrista nictitans	Wild sensitive plant		X					
Cirsium nuttallii	Nuttall's thistle							
Commelina diffusa	Dayflower	X	X					
Commelina gambiae	Gambian dayflower							
Conyza canadensis	Dwarf horseweed							
Coreopsis leavenworthii	Leavenworth's tickseed	X						
Crotalaria pallida	Smooth rattle-box							
Crotalaria rotundifolia	Rabbitbells							
Cuphea carthagenensis	Columbian waxweed							
Cynodon dactylon	Bermuda grass	X						
Cyperus alopecuroides	Foxtail flatsedge	X						
Cyperus compressus	Poorland flatsedge	X			**X**		**X**	
Cyperus croceus	Baldwin flatsedge		X					
Cyperus flavescens	Yellow flatsedge							
Cyperus iria	Rice flatsedge							
Cyperus lanceolatus	Epiphytic flatsedge	X						
Cyperus ligularis	Swamp flatsedge	X						
Cyperus odoratus	Fragrant flatsedge	X						
Cyperus strigosus	Straw colored flatsedge							
Cyperus surinamensis	Tropical flatsedge							
Desmodium triflorum	Beggarweed							
Dichanthelium acuminatum	Panic grass							

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add
Dichanthelium commutatum	Variable witchgrass							
Digitaria ciliaris	Southern crabgrass	X	X				**X**	
Digitaria longiflora	Indian crabgrass							
Digitaria serotina	Hairy crabgrass		X					
Diodia virginiana	Rough button-weed							
Drymaria cordata	West Indian chickweed		X					
Eclipta prostrata	Upright burhead	X						
Eleocharis interstincta	Knotted spikerush							
Eragrostis atrovirens	Thalia lovegrass							
Eragrostis elliottii	Elliot's lovegrass	X	X					
Eragrostis spectabilis	Purple lovegrass		X					
Erechtites hieraciifolius	Fireweed		X					
Eupatorium capillifolium	Dogfennel		X			**X**		
Eupatorium serotinum	Late-flowering thorough-wort							
Euthamia caroliniana	Slender goldenrod							
Fimbristylis dichotoma	Forked fimbry							
Galactia elliotii	Milkpea		X					
Gamochaeta pensylvanica	Pennsylvania everlasting		X					
Gelsemium sempervirens	Yellow jessamine		X					
Heterotheca subaxillaris	Camphorweed							
Hydrocotyle umbellata	Manyflower marshpennywort		X					
Hymenachne amplexicaulis	Trompetilla	X						
Hypericum tetrapetalum	St. John's wort							
Hyptis verticillata	John Charles							
Imperata cylindrica	Cogon grass	X						
Indigofera hirsuta	Hairy indigo	X						
Ipomoea triloba	Littlebell							
Juncus marginatus	Grassleaf rush							
Juncus megacephalus	Bighead rush							
Juncus scirpoides	Needlepod rush							
Kyllinga brevifolia	Shortleaf spikesedge	X						
Lactuca graminifolia	Grassleaf lettuce							
Lindernia crustacea	Malaysian false pimpernel	X			**X**	**X**		
Liquidambar styraciflua	Sweetgum		X					
Ludwigia maritima	Seaside primrosewillow	X						
Ludwigia octovalvis	Large seedbox	X		**X**		**X**	**X**	
Ludwigia peruviana	Primrose willow							
Ludwigia repens	Red-leaf ludwigia							
Lygodium japonicum	Japanese climbing fern							
Lygodium microphyllum	Small-leaf climbing fern							
Lythrum alatum	Winged lythrum	X						
Myrica cerifera	Wax myrtle		X					
Melochia corchorifolia	Chocolate-weed	X						
Melinis repens	Natalgrass	X						

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add
Mikania scandens	Climbing hempvine	X						
Mollugo verticillata	Green carpetweed							
Murdannia nudiflora	Naked-stem dewflower							
Nephrolepis exaltata	Boston fern							
Oldenlandia uniflora	Clustered millie graines		X					
Oxalis corniculata	Yellow wood sorrel		X					
Panicum dichotomiflorum	Fall panicum							
Panicum hemitomon	Maidencane		X					
Panicum repens	Torpedo grass							
Paspalum dilatatum	Dallisgrass	X						
Paspalum notatum	Bahia grass	X						
Paspalum setaceum	Thin paspalum		X					
Paspalum urvillei	Vaseygrass	X					**X**	
Physalis angulata	Cutleaf ground cherry							
Phyla nodiflora	Frog-fruit							
Phyllanthus urinaria	Chamberbitter							
Pityopsis graminifolia	Narrowleaf silkgrass							
Polygonum punctatum	Dotted smartweed	X				**X**		
Polypremum procumbens	Rustweed	X						
Praxelis clematidea	Praxelis	X						
Pseudognaphalium obtusifolium	Rabbit tobacco							
Pterocaulon pycnostachyum	Blackroot							
Rhexia mariana	Meadow-beauty							
Richardia brasiliensis	Richardia	X						
Ricinus communis	Castor bean	X						
Rubus pensilvanicus	Sawtooth blackberry							
Sacciolepis indica	Glenwood grass	X				**X**		
Sagittaria lancifolia	Bulltongue arrowhead	X						
Salix caroliniana	Southern willow							
Schoenoplectus tabernaemontani	Softstem bulrush							
Scleria baldwinii	Baldwin's nutrush							
Scoparia dulcis	Licorice weed	X	X		**X**		**X**	
Serenoa repens	Saw palmetto		X					
Sesbania herbacea	Danglepod	X						**X**
Setaria parviflora	Knotroot bristle grass	X		**X**		**X**		
Sida cordifolia	Llima							
Sida rhombifolia	Indian hemp		X					
Smilax bona-nox	Saw greenbrier		X					
Solidago fistulosa	Pine-barren goldenrod		X					
Solidago sempervirens	Seaside goldenrod	X						
Solanum viarum	Tropical soda apple							
Spartina bakeri	Sand cordgrass							
Spermacoce remota	Woodland false buttonweed							
Spermacoce verticillata	Shrubby false buttonweed	X						
Sporobolus indicus	Smutgrass	X						
Symphyotrichum bahamense	Annual saltmarsh aster	X						

x = occurrence within the quadrat

TABLE 105: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (RECLAMA
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T20-QN	T20-QS	T20-QE	T20-QW	T20-Add
Thelypteris kunthii	Southern shield fern		X					
Typha sp.	Cattail							
Urena lobata	Caesarweed	X		**X**	**X**			
Urochloa distachya	Tropical signal grass							
Woodwardia virginica	Virginia chain fern							
Xyris sp.	Yellow-eyed grass							
Yucca filamentosa	Adam's needle							
Totals		**47**	**33***					

***** Total number of HCPMRM List Species observed since monitoring started

x = occurrence within the quadrat

TABLE 106: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Agalinis fasciculata	Beach False-foxglove																	
Ambrosia artemisiifolia	Common ragweed		X															
Ampelopsis arborea	Pepper-vine		X															
Andropogon glomeratus	Bushy bluestem	X													**X**	**X**	**X**	
Andropogon virginicus	Broomsedge	X	X											**X**				
Axonopus furcatus	Flat-joint carpet grass																	
Bidens alba (synonym B. pilosa)	White beggar-ticks	X	X															
Bidens mitis	Small-fruit beggar-ticks																	
Blechnum serrulatum	Swamp fern																	
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry		X															
Campsis radicans	Trumpet-vine		X															
Centella asiatica	Asian coinwort		X															
Chasmanthium laxum	Slender spikegrass	X	X															
Commelina diffusa	Dayflower	X	X															
Coreopsis leavenworthii	Leavenworth's tickseed																	
Cynodon dactylon	Bermuda grass																	
Cyperus croceus	Baldwin flatsedge	X	X											**X**				
Cyperus flavescens	Yellow flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Desmodium triflorum	Beggarweed	X																
Dichanthelium acuminatum	Panic grass	X													**X**		**X**	
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Drymaria cordata	West Indian chickweed		X															
Elephantopus elatus	Tall elephantsfoot	X	X												**X**			
Emilia sonchifolia	Tasselflower																	
Erechtites hieraciifolius	Fireweed	X	X															
Eupatorium capillifolium	Dogfennel		X						**X**									
Euthamia caroliniana	Slender goldenrod																	
Galactia elliotii	Milkpea		X															
Gelsemium sempervirens	Yellow jessamine		X	**X**	**X**				**X**	**X**	**X**	**X**			**X**		**X**	
Gordonia lasianthus	Loblolly bay																	
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort	X												**X**				
Hypericum fasciculatum	Sand-weed St. John's-wort																	
Hypericum hypericoides	St. Andrews cross	X	X															
Hyptis verticillata	John Charles																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo																	
Juncus effusus	Softrush	X												**X**		**X**		
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnocaulon anceps	White-head bogbutton	X																

x = occurence within quadrat

TABLE 106: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T11-QN	T11-QS	T11-QE	T11-QW	T11-Add	T12-QN	T12-QS	T12-QE	T12-QW	T12-Add	T13-QN	T13-QS	T13-QE	T13-QW	T13-Add
Lindernia crustacea	Malaysian false pimpernel	X																
Lobelia glandulosa	Glade lobelia	X																
Ludwigia maritima	Seaside primrosewillow	X																
Ludwigia peruviana	Primrose willow																	
Lygodium japonicum	Japanese climbing fern																	
Magnolia virginiana	Sweetbay																	
Momordica charantia	Wild balsam apple																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern													X				
Oldenlandia corymbosa	Flattop mille graines	X																
Osmunda cinnamomea	Cinnamon fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass																	
Parthenocissus quinquefolia	Virginia creeper		X							X								
Paspalum conjugatum	Sour paspalum		X															
Paspalum floridanum	Florida paspalum	X	X													X		
Paspalum notatum	Bahia grass	X					X							X	X			
Paspalum setaceum	Thin paspalum		X															
Peltandra virginica	Arrow arum																	
Persea palustris	Swamp bay																	
Pleopeltis polypodioides var. michauxiana	Resurrection fern		X															
Polygonum punctatum	Dotted smartweed																	
Pterocaulon pycnostachyum	Blackroot																	
Quercus nigra	Water oak		X															
Quercus virginiana	Live oak		X															
Rhexia mariana	Meadow-beauty	X																
Rhynchospora fascicularis	Fasciculate beakrush	X																
Rubus argutus	Sawtooth blackberry		X									X						
Rubus cuneifolius	Sand Blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm		X															
Sacciolepis indica	Glenwood grass	X							X	X								
Scoparia dulcis	Licorice weed	X	X															
Setaria parviflora	Knotroot bristle grass	X														X		
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier		X	X	X	X	X					X						
Solidago fistulosa	Pine-barren goldenrod	X	X												X			
Syngonium podophyllum	American evergreen																	
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy		X			X												
Urena lobata	Caesarweed	X		X	X	X	X		X		X	X		X		X		
Vaccinium corymbosum	Highbush blueberry		X															
Vitis rotundifolia	Muscadine grape		X		X				X	X	X	X						
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
Zingiber zerumbet	Bitter ginger								X	X	X	X						
Totals		**34**	**40***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 107: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T107-QN	T107-QS	T107-QE	T107-QW	T107-Add	T108-QN	T108-QS	T108-QE	T108-QW	T108-Add	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add
Acalypha gracilens	Slender threeseed mercury		X															
Acer rubrum	Red maple		X															
Acrostichum danaeifolium	Giant leather fern																	
Ampelopsis arborea	Pepper-vine		X															
Andropogon glomeratus	Bushy bluestem	X						**X**										
Andropogon virginicus	Broomsedge		X															
Aristida stricta	Wiregrass																	
Asimina obovata	Bigflower pawpaw																	
Baccharis halimifolia	Eastern false-willow		X															
Blechnum serrulatum	Swamp fern																	
Callicarpa americana	American beauty-berry		X										**X**				**X**	
Centella asiatica	Asian coinwort		X															
Ceratopteris thalictroides	Watersprite																	
Cirsium nuttallii	Nuttall's thistle																	
Commelina diffusa	Dayflower	X	X															
Crotalaria pallida	Smooth rattle-box	X																
Cynodon dactylon	Bermuda grass	X																
Cyperus compressus	Poorland flatsedge	X																
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus haspan	Haspan flatsedge	X																
Cyperus retrorsus	Pinebarren flatsedge		X															
Cyperus strigosus	Straw colored flatsedge	X																
Cyperus surinamensis	Tropical flatsedge	X																
Desmodium incanum	Zarzabacao comun	X	X															
Dichanthelium aciculare	Needleleaf witchgrass																	
Dichanthelium acuminatum	Panic grass	X		**X**			**X**								**X**			
Dichanthelium commutatum	Variable witchgrass																	
Digitaria ciliaris	Southern crabgrass	X	X															
Digitaria longiflora	Indian crabgrass																	
Digitaria serotina	Hairy crabgrass		X															
Drymaria cordata	West Indian chickweed		X															
Eleocharis baldwinii	Baldwin's spikerush																	
Elephantopus elatus	Tall elephantsfoot		X															
Emilia fosbergii	Florida tasselflower																	
Erechtites hieraciifolius	Fireweed		X					**X**										
Eriocaulon decangulare	Ten-angle pipewort																	
Eupatorium capillifolium	Dogfennel		X															
Euthamia caroliniana	Slender goldenrod																	
Galactia elliotii	Milkpea		X															
Gelsemium sempervirens	Yellow jessamine		X															
Helianthus angustifolius	Narrowleaf sunflower	X																**X**
Hydrocotyle umbellata	Manyflower marshpennywort		X															
Hypericum cistifolium	Round-pod St. John's wort																	
Hypericum hypericoides	St. Andrews cross		X															
Hypericum tetrapetalum	St. John's wort																	

x = occurence within quadrat

TABLE 107: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T107-QN	T107-QS	T107-QE	T107-QW	T107-Add	T108-QN	T108-QS	T108-QE	T108-QW	T108-Add	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add
Ilex cassine	Dahoon holly																	
Ilex glabra	Gallberry								X									
Imperata cylindrica	Cogon grass	X																
Juncus marginatus	Grassleaf rush	X																
Kyllinga brevifolia	Shortleaf spikesedge	X																
Lachnocaulon anceps	White-head bogbutton																	
Lindernia crustacea	Malaysian false pimpernel	X																X
Liquidambar styraciflua	Sweetgum		X															
Ludwigia maritima	Seaside primrosewillow																	
Ludwigia octovalvis	Large seedbox	X																
Ludwigia peruviana	Primrose willow	X																
Luziola fluitans	Southern watergrass																	
Lycopodiella cernua	Nodding clubmoss																	
Lygodium japonicum	Japanese climbing fern																	
Lyonia fruticosa	Coastplain Staggerbush																	
Lythrum alatum	Winged lythrum																	
Murdannia nudiflora	Naked-stem dewflower																	
Myrica cerifera	Wax myrtle		X															
Nephrolepis exaltata	Boston fern																	
Nyssa sylvatica var. biflora	Swamp tupelo																	
Oldenlandia uniflora	Clustered millie graines		X															
Osmunda cinnamomea	Cinnamon fern								X		X							
Osmunda regalis	Royal fern																	
Oxalis corniculata	Yellow wood sorrel	X	X															
Paederia foetida	Skunkvine	X																
Panicum anceps	Beaked panic grass		X															
Panicum dichotomiflorum	Fall panicum	X																
Panicum hemitomon	Maidencane		X															
Panicum rigidulum	Red-top panic grass	X						X							X			
Parthenocissus quinquefolia	Virginia creeper		X											X				
Paspalum conjugatum	Sour paspalum		X															
Paspalum notatum	Bahia grass	X													X			
Paspalum setaceum	Thin paspalum		X															
Persea borbonia	Red bay		X								X							
Phyllanthus urinaria	Chamberbitter	X																
Pinus elliottii	Slash pine		X															
Pityopsis graminifolia	Narrowleaf silkgrass																	
Polygonum punctatum	Dotted smartweed	X																
Pontederia cordata	Pickerelweed	X																
Pouzolzia zeylanica	Pouzolz's bush																	
Praxelis clematidea	Praxelis																	
Pteridium aquilinum	Bracken fern		X															
Quercus laurifolia	Laurel oak		X													X		
Quercus nigra	Water oak		X						X									
Quercus virginiana	Live oak		X															

x = occurence within quadrat

TABLE 107: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T107-QN	T107-QS	T107-QE	T107-QW	T107-Add	T108-QN	T108-QS	T108-QE	T108-QW	T108-Add	T109-QN	T109-QS	T109-QE	T109-QW	T109-Add
Rhexia mariana	Meadow-beauty																	
Rhynchospora baldwinii	Baldwin's beakrush																	
Rhynchospora fascicularis	Fasciculate beakrush	X																
Rubus argutus	Sawtooth blackberry		X															
Sabal palmetto	Cabbage palm		X															
Sacciolepis striata	American cupscale																	
Sagittaria lancifolia	Bulltongue arrowhead																	
Saururus cernuus	Lizard's tail																	
Scleria baldwinii	Baldwin's nutrush																	
Scoparia dulcis	Licorice weed	X	X															
Serenoa repens	Saw palmetto		X											**X**		**X**		
Setaria parviflora	Knotroot bristle grass	X																
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier		X	**X**	**X**		**X**											**X**
Solidago fistulosa	Pine-barren goldenrod		X															
Solidago sempervirens	Seaside goldenrod																	
Sporobolus indicus	Smutgrass																	
Syngonanthus flavidulus	Bantam-buttons																	
Thelypteris kunthii	Southern shield fern		X															
Tillandsia usneoides	Spanish moss		X															
Toxicodendron radicans	Poison ivy		X					**X**										**X**
Urena lobata	Caesarweed	X		**X**			**X**										**X**	
Urena lobata	Caesarweed																	
Vaccinium myrsinites	Shiny blueberry																	
Vaccinium stamineum	Deerberry																	
Vicia acutifolia	Four-leaf vetch																	
Vitis rotundifolia	Muscadine grape		X						**X**	**X**	**X**	**X**						
Woodwardia areolata	Netted chain fern																	
Woodwardia virginica	Virginia chain fern																	
Zephyranthes simpsonii	Simpson's zephyrlily																	
Totals		**31**	**47***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 107: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIV
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add
Acalypha gracilens	Slender threeseed mercury		X					
Acer rubrum	Red maple		X					
Acrostichum danaeifolium	Giant leather fern							
Ampelopsis arborea	Pepper-vine		X					
Andropogon glomeratus	Bushy bluestem	X			**X**	**X**	**X**	
Andropogon virginicus	Broomsedge		X					
Aristida stricta	Wiregrass							
Asimina obovata	Bigflower pawpaw							
Baccharis halimifolia	Eastern false-willow		X					**X**
Blechnum serrulatum	Swamp fern							
Callicarpa americana	American beauty-berry		X					
Centella asiatica	Asian coinwort		X					
Ceratopteris thalictroides	Watersprite							**X**
Cirsium nuttallii	Nuttall's thistle							
Commelina diffusa	Dayflower	X	X				**X**	
Crotalaria pallida	Smooth rattle-box	X						
Cynodon dactylon	Bermuda grass	X					**X**	
Cyperus compressus	Poorland flatsedge	X						
Cyperus croceus	Baldwin flatsedge	X	X					
Cyperus haspan	Haspan flatsedge	X						
Cyperus retrorsus	Pinebarren flatsedge		X					
Cyperus strigosus	Straw colored flatsedge	X						**X**
Cyperus surinamensis	Tropical flatsedge	X						
Desmodium incanum	Zarzabacao comun	X	X		**X**			
Dichanthelium aciculare	Needleleaf witchgrass							
Dichanthelium acuminatum	Panic grass	X						
Dichanthelium commutatum	Variable witchgrass							
Digitaria ciliaris	Southern crabgrass	X	X					
Digitaria longiflora	Indian crabgrass							
Digitaria serotina	Hairy crabgrass		X					
Drymaria cordata	West Indian chickweed		X			**X**		
Eleocharis baldwinii	Baldwin's spikerush							
Elephantopus elatus	Tall elephantsfoot		X					
Emilia fosbergii	Florida tasselflower							
Erechtites hieraciifolius	Fireweed		X					
Eriocaulon decangulare	Ten-angle pipewort							
Eupatorium capillifolium	Dogfennel		X	**X**	**X**	**X**	**X**	
Euthamia caroliniana	Slender goldenrod							
Galactia elliotii	Milkpea		X					
Gelsemium sempervirens	Yellow jessamine		X					
Helianthus angustifolius	Narrowleaf sunflower	X						
Hydrocotyle umbellata	Manyflower marshpennywort		X					
Hypericum cistifolium	Round-pod St. John's wort							
Hypericum hypericoides	St. Andrews cross		X					
Hypericum tetrapetalum	St. John's wort							

x = occurence within quadrat

TABLE 107: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIV
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add
Ilex cassine	Dahoon holly							
Ilex glabra	Gallberry							
Imperata cylindrica	Cogon grass	X			**X**			
Juncus marginatus	Grassleaf rush	X						**X**
Kyllinga brevifolia	Shortleaf spikesedge	X						**X**
Lachnocaulon anceps	White-head bogbutton							
Lindernia crustacea	Malaysian false pimpernel	X						**X**
Liquidambar styraciflua	Sweetgum		X					
Ludwigia maritima	Seaside primrosewillow							
Ludwigia octovalvis	Large seedbox	X						
Ludwigia peruviana	Primrose willow	X						
Luziola fluitans	Southern watergrass							
Lycopodiella cernua	Nodding clubmoss							
Lygodium japonicum	Japanese climbing fern							**X**
Lyonia fruticosa	Coastplain Staggerbush							
Lythrum alatum	Winged lythrum							
Murdannia nudiflora	Naked-stem dewflower							
Myrica cerifera	Wax myrtle		X					
Nephrolepis exaltata	Boston fern							
Nyssa sylvatica var. biflora	Swamp tupelo							
Oldenlandia uniflora	Clustered millie graines		X					
Osmunda cinnamomea	Cinnamon fern							
Osmunda regalis	Royal fern							
Oxalis corniculata	Yellow wood sorrel	X	X				**X**	
Paederia foetida	Skunkvine	X						**X**
Panicum anceps	Beaked panic grass		X					
Panicum dichotomiflorum	Fall panicum	X						**X**
Panicum hemitomon	Maidencane		X		**X**			
Panicum rigidulum	Red-top panic grass	X						
Parthenocissus quinquefolia	Virginia creeper		X	**X**				
Paspalum conjugatum	Sour paspalum		X					
Paspalum notatum	Bahia grass	X						
Paspalum setaceum	Thin paspalum		X					
Persea borbonia	Red bay		X					
Phyllanthus urinaria	Chamberbitter	X						
Pinus elliottii	Slash pine		X					
Pityopsis graminifolia	Narrowleaf silkgrass							
Polygonum punctatum	Dotted smartweed	X						**X**
Pontederia cordata	Pickerelweed	X						
Pouzolzia zeylanica	Pouzolz's bush				**X**			
Praxelis clematidea	Praxelis							
Pteridium aquilinum	Bracken fern		X					
Quercus laurifolia	Laurel oak		X					**X**
Quercus nigra	Water oak		X					
Quercus virginiana	Live oak		X					

x = occurence within quadrat

TABLE 107: HERBACEOUS INVENTORY MATRIX - TEMPERATE HARDWOODS (NATIV
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T110-QN	T110-QS	T110-QE	T110-QW	T110-Add
Rhexia mariana	Meadow-beauty							
Rhynchospora baldwinii	Baldwin's beakrush							
Rhynchospora fascicularis	Fasciculate beakrush	X						
Rubus argutus	Sawtooth blackberry		X					
Sabal palmetto	Cabbage palm		X					
Sacciolepis striata	American cupscale							
Sagittaria lancifolia	Bulltongue arrowhead							
Saururus cernuus	Lizard's tail							
Scleria baldwinii	Baldwin's nutrush							
Scoparia dulcis	Licorice weed	X	X					**X**
Serenoa repens	Saw palmetto		X					
Setaria parviflora	Knotroot bristle grass	X					**X**	
Smilax auriculata	Earleaf greenbriar		X					
Smilax bona-nox	Saw greenbrier		X					
Solidago fistulosa	Pine-barren goldenrod		X					
Solidago sempervirens	Seaside goldenrod							
Sporobolus indicus	Smutgrass				**X**			
Syngonanthus flavidulus	Bantam-buttons							
Thelypteris kunthii	Southern shield fern		X					
Tillandsia usneoides	Spanish moss		X					
Toxicodendron radicans	Poison ivy		X					
Urena lobata	Caesarweed	X		**X**		**X**	**X**	
Urena lobata	Caesarweed							
Vaccinium myrsinites	Shiny blueberry							
Vaccinium stamineum	Deerberry							
Vicia acutifolia	Four-leaf vetch				**X**			
Vitis rotundifolia	Muscadine grape		X					**X**
Woodwardia areolata	Netted chain fern							
Woodwardia virginica	Virginia chain fern							
Zephyranthes simpsonii	Simpson's zephyrlily							
Totals		**31**	**47***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 108: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T103-QN	T103-QS	T103-QE	T103-QW	T103-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Abutilon theophrasti	Velvetleaf	X													X	X	X	
Aeschynomene americana	Meadow joint-vetch	X																
Agalinis fasciculata	Beach False-foxglove		X															
Alysicarpus ovalifolius	False moneywort	X																
Ambrosia artemisiifolia	Common ragweed		X															
Andropogon glomeratus	Bushy bluestem	X																
Andropogon sp.	Broomsedge	X	X															
Andropogon virginicus	Broomsedge	X	X			X					X	X						
Aristida spiciformis	Pinebarren three-awn																	
Aristida stricta	Wiregrass		X															
Asimina obovata	Bigflower pawpaw		X															
Buchnera americana	American bluehearts	X	X															
Bulbostylis barbata	Watergrass	X																
Callicarpa americana	American beauty-berry	X	X															
Carya glabra	Pignut hickory																	
Chamaecrista nictitans	Wild sensitive plant																	
Chamaesyce hirta	Pillpod sandmat																	
Chamaesyce hyssopifolia	Hyssopleaf sandmat																	
Commelina gambiae	Gambian dayflower																	
Conyza canadensis	Dwarf horseweed	X												X	X	X		
Coreopsis leavenworthii	Leavenworth's tickseed	X																
Crotalaria pallida	Smooth rattle-box	X								X				X		X	X	
Crotalaria rotundifolia	Rabbitbells	X	X													X	X	
Croton michauxii	Rushfoil	X	X															
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X							X	X	X						
Cyperus virens	Green flatsedge	X																
Desmodium incanum	Zarzabacao comun	X																
Desmodium triflorum	Beggarweed	X																
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X																
Elephantopus elatus	Tall elephantsfoot		X															
Emilia sonchifolia	Tasselflower																	
Eragrostis elliottii	Elliot's lovegrass		X								X							
Erechtites hieraciifolius	Fireweed	X																
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium	X																
Eupatorium mohrii	Eupatorium		X															
Eustachys glauca	Saltmarsh fingergrass																	
Euthamia caroliniana	Slender goldenrod			X			X									X		
Galactia elliotii	Milkpea		X															
Gamochaeta pensylvanica	Pennsylvania everlasting			X												X		
Helianthemum corymbosum	Pinebarren frostweed	X																
Hydrocotyle umbellata	Manyflower marshpennywort																	
Hypericum cistifolium	Round-pod St. John's wort	X																

x = occurrence within quadrat

TABLE 108: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T103-QN	T103-QS	T103-QE	T103-QW	T103-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Hypericum tetrapetalum	St. John's wort	X																
Hyptis alata	Musky mint	X																
Hyptis verticillata	John Charles																	
Indigofera hirsuta	Hairy indigo	X								X								
Lachnocaulon anceps	White-head bogbutton	X																
Lechea deckertii	Deckert's pinweed		X															
Lepidium virginicum	Pepper grass	X																
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel																	
Ludwigia maritima	Seaside primrosewillow	X			X													
Ludwigia octovalvis	Large seedbox	X			X													
Macroptilium lathyroides	Phaseolus	X																
Melinis repens	Natalgrass	X							X	X		X		X			X	
Muhlenbergia capillaris	Gulf muhly grass	X																
Opuntia humifusa	Pricklypear		X															
Oxalis corniculata	Yellow wood sorrel																	
Panicum anceps	Beaked panic grass		X															
Panicum rigidulum	Red-top panic grass	X		X														
Panicum verrucosum	Warty panic grass																	
Paspalum conjugatum	Sour paspalum																	
Paspalum notatum	Bahia grass	X		X	X	X	X											
Paspalum setaceum	Thin paspalum	X	X	X														
Phyllanthus urinaria	Chamberbitter	X																
Piloblephis rigida	Wild pennyroyal	X	X															
Pinus clausa	Sand pine		X															
Pinus elliottii	Slash pine																	
Pityopsis graminifolia	Narrowleaf silkgrass	X	X												X	X	X	
Polygyala rugelii	Yellow milwort																	
Polypremum procumbens	Rustweed	X							X		X						X	
Portulaca pilosa	Pink purslane	X																
Praxelis clematidea	Praxelis	X								X		X						
Pterocaulon pycnostachyum	Blackroot																	
Quercus chapmanii	Chapman's oak		X															
Quercus geminata	Sand live oak		X															
Quercus laevis	Turkey oak		X															
Quercus virginiana	Live oak																	
Rhus copallinum	Winged sumac		X															
Rhynchospora microcarpa	Southern beakrush	X	X	X														
Richardia brasiliensis	Richardia	X																
Rubus argutus	Sawtooth blackberry																	
Rubus pensilvanicus	Sawtooth blackberry																	
Sabal palmetto	Cabbage palm																	
Sabatia brevifolia	Shortleaf rosegentian	X																
Sacciolepis indica	Glenwood grass	X																
Scoparia dulcis	Licorice weed	X		X					X					X	X		X	

x = occurrence within quadrat

TABLE 108: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T103-QN	T103-QS	T103-QE	T103-QW	T103-Add	T104-QN	T104-QS	T104-QE	T104-QW	T104-Add	T105-QN	T105-QS	T105-QE	T105-QW	T105-Add
Serenoa repens	Saw palmetto		X															
Sesbania herbacea	Danglepod	X																
Setaria parviflora	Knotroot bristle grass	X							**X**									
Smilax auriculata	Earleaf greenbriar		X															
Smilax bona-nox	Saw greenbrier																	
Solidago fistulosa	Pine-barren goldenrod	X																
Sphagnum sp.	Moss																	
Sporobolus indicus	Smutgrass	X							**X**									
Syngonanthus flavidulus	Bantam-buttons																	
Tillandsia usneoides	Spanish moss																	
Urena lobata	Caesarweed													**X**	**X**	**X**		
Vaccinium corymbosum	Highbush blueberry	X																
Vaccinium myrsinites	Shiny blueberry	X	X															
Vicia acutifolia	Four-leaf vetch																	
Viola sororia	Common blue violet	X																
Vitis rotundifolia	Muscadine grape		X															
Woodwardia virginica	Virginia chain fern																	
Xyris sp.	Yellow-eyed grass	X																
	Totals	**56**	**35***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within quadrat

TABLE 108: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T106-QN	T106-QS	T106-QE	T106-QW	T106-Add
Abutilon theophrasti	Velvetleaf	X						
Aeschynomene americana	Meadow joint-vetch	X						
Agalinis fasciculata	Beach False-foxglove		X					
Alysicarpus ovalifolius	False moneywort	X						
Ambrosia artemisiifolia	Common ragweed		X					
Andropogon glomeratus	Bushy bluestem	X						
Andropogon sp.	Broomsedge	X	X					
Andropogon virginicus	Broomsedge	X	X	**X**		**X**		
Aristida spiciformis	Pinebarren three-awn							
Aristida stricta	Wiregrass		X					
Asimina obovata	Bigflower pawpaw		X					
Buchnera americana	American bluehearts	X	X					
Bulbostylis barbata	Watergrass	X						
Callicarpa americana	American beauty-berry	X	X					
Carya glabra	Pignut hickory							
Chamaecrista nictitans	Wild sensitive plant							
Chamaesyce hirta	Pillpod sandmat							
Chamaesyce hyssopifolia	Hyssopleaf sandmat							
Commelina gambiae	Gambian dayflower							
Conyza canadensis	Dwarf horseweed	X						
Coreopsis leavenworthii	Leavenworth's tickseed	X						
Crotalaria pallida	Smooth rattle-box	X						
Crotalaria rotundifolia	Rabbitbells	X	X					
Croton michauxii	Rushfoil	X	X	**X**				
Cyperus croceus	Baldwin flatsedge	X	X	**X**				
Cyperus retrorsus	Pinebarren flatsedge	X	X					
Cyperus virens	Green flatsedge	X						
Desmodium incanum	Zarzabacao comun	X						
Desmodium triflorum	Beggarweed	X						
Dichanthelium aciculare	Needleleaf witchgrass		X					
Dichanthelium acuminatum	Panic grass	X		**X**				
Elephantopus elatus	Tall elephantsfoot		X					
Emilia sonchifolia	Tasselflower							
Eragrostis elliottii	Elliot's lovegrass		X	**X**				
Erechtites hieraciifolius	Fireweed	X						
Eupatorium capillifolium	Dogfennel		X		**X**	**X**	**X**	
Eupatorium mohrii	Eupatorium	X						
Eupatorium mohrii	Eupatorium		X					
Eustachys glauca	Saltmarsh fingergrass							
Euthamia caroliniana	Slender goldenrod			**X**	**X**	**X**		
Galactia elliotii	Milkpea		X					
Gamochaeta pensylvanica	Pennsylvania everlasting					**X**		
Helianthemum corymbosum	Pinebarren frostweed	X		**X**				
Hydrocotyle umbellata	Manyflower marshpennywort							
Hypericum cistifolium	Round-pod St. John's wort	X						

x = occurrence within quadrat

TABLE 108: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T106-QN	T106-QS	T106-QE	T106-QW	T106-Add
Hypericum tetrapetalum	St. John's wort	X		**X**			**X**	
Hyptis alata	Musky mint	X						
Hyptis verticillata	John Charles							
Indigofera hirsuta	Hairy indigo	X		**X**				
Lachnocaulon anceps	White-head bogbutton	X						
Lechea deckertii	Deckert's pinweed		X	**X**				
Lepidium virginicum	Pepper grass	X						
Licania michauxii	Gopher apple		X					
Lindernia crustacea	Malaysian false pimpernel							
Ludwigia maritima	Seaside primrosewillow	X						
Ludwigia octovalvis	Large seedbox	X						
Macroptilium lathyroides	Phaseolus	X						
Melinis repens	Natalgrass	X						
Muhlenbergia capillaris	Gulf muhly grass	X						
Opuntia humifusa	Pricklypear		X					
Oxalis corniculata	Yellow wood sorrel							
Panicum anceps	Beaked panic grass		X					
Panicum rigidulum	Red-top panic grass	X						
Panicum verrucosum	Warty panic grass							
Paspalum conjugatum	Sour paspalum							
Paspalum notatum	Bahia grass	X		**X**	**X**	**X**	**X**	
Paspalum setaceum	Thin paspalum	X	X		**X**			
Phyllanthus urinaria	Chamberbitter	X				**X**		
Piloblephis rigida	Wild pennyroyal	X	X					
Pinus clausa	Sand pine		X					
Pinus elliottii	Slash pine							
Pityopsis graminifolia	Narrowleaf silkgrass	X	X					
Polygyala rugelii	Yellow milwort							
Polypremum procumbens	Rustweed	X		**X**	**X**		**X**	
Portulaca pilosa	Pink purslane	X						
Praxelis clematidea	Praxelis	X						
Pterocaulon pycnostachyum	Blackroot							
Quercus chapmanii	Chapman's oak		X					
Quercus geminata	Sand live oak		X					
Quercus laevis	Turkey oak		X					
Quercus virginiana	Live oak							
Rhus copallinum	Winged sumac		X		**X**			
Rhynchospora microcarpa	Southern beakrush	X	X					
Richardia brasiliensis	Richardia	X						
Rubus argutus	Sawtooth blackberry							
Rubus pensilvanicus	Sawtooth blackberry							
Sabal palmetto	Cabbage palm							
Sabatia brevifolia	Shortleaf rosegentian	X		**X**				
Sacciolepis indica	Glenwood grass	X						
Scoparia dulcis	Licorice weed	X		**X**				

x = occurrence within quadrat

TABLE 108: HERBACEOUS INVENTORY MATRIX - XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T106-QN	T106-QS	T106-QE	T106-QW	T106-Add
Serenoa repens	Saw palmetto		X					
Sesbania herbacea	Danglepod	X						
Setaria parviflora	Knotroot bristle grass	X						
Smilax auriculata	Earleaf greenbriar		X		**X**			
Smilax bona-nox	Saw greenbrier			**X**				
Solidago fistulosa	Pine-barren goldenrod	X						
Sphagnum sp.	Moss							
Sporobolus indicus	Smutgrass	X						
Syngonanthus flavidulus	Bantam-buttons							
Tillandsia usneoides	Spanish moss							
Urena lobata	Caesarweed			**X**				
Vaccinium corymbosum	Highbush blueberry	X						
Vaccinium myrsinites	Shiny blueberry	X	X					
Vicia acutifolia	Four-leaf vetch							
Viola sororia	Common blue violet	X						
Vitis rotundifolia	Muscadine grape		X					
Woodwardia virginica	Virginia chain fern							
Xyris sp.	Yellow-eyed grass	X						
	Totals	**56**	**35***					

* Total number of HCPMRM List Species observed since monitoring started

x = occurrence within quadrat

TABLE 109: HERBACEOUS INVENTORY MATRIX - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T100-QN	T100-QS	T100-QE	T100-QW	T100-Add	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T102-QN	T102-QS	T102-QE	T102-QW	T102-Add
Andropogon glomeratus	Bushy bluestem																	
Andropogon virginicus	Broomsedge	X	X				**X**					**X**						**X**
Aristida spiciformis	Pinebarren three-awn																	
Aristida stricta	Wiregrass		X													**X**		
Asimina obovata	Bigflower pawpaw		X															
Axonopus furcatus	Flat-joint carpet grass																	
Balduina angustifolia	Yellow buttons		X															
Bulbostylis barbata	Watergrass																	
Callicarpa americana	American beauty-berry		X															
Chamaecrista nictitans	Wild sensitive plant																	
Crotalaria rotundifolia	Rabbitbells		X															
Croton michauxii	Rushfoil	X	X															**X**
Cyperus croceus	Baldwin flatsedge	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X															**X**
Dichanthelium aciculare	Needleleaf witchgrass		X															
Dichanthelium acuminatum	Panic grass	X		**X**	**X**	**X**									**X**		**X**	
Elephantopus elatus	Tall elephantsfoot		X															
Eragrostis elliottii	Elliot's lovegrass	X	X		**X**													**X**
Eryngium aromaticum	Fragrant eryngo		X															
Eupatorium capillifolium	Dogfennel		X			**X**												**X**
Euphorbia polyphylla	Lesser Florida spruge		X															
Euthamia caroliniana	Slender goldenrod																	**X**
Fimbristylis autumnalis	Fringe-rush																	
Fimbristylis dichotoma	Forked fimbry																	
Galactia elliotii	Milkpea		X															**X**
Gamochaeta pensylvanica	Pennsylvania everlasting																	
Gelsemium sempervirens	Yellow jessamine																	
Helianthemum corymbosum	Pinebarren frostweed	X																**X**
Hypericum cistifolium	Round-pod St. John's wort																	
Hypericum tetrapetalum	St. John's wort	X																
Hypoxis juncea	Yellow star grass																	
Imperata cylindrica	Cogon grass																	
Indigofera hirsuta	Hairy indigo																	
Lachnocaulon anceps	White-head bogbutton	X																
Lechea deckertii	Deckert's pinweed		X															
Licania michauxii	Gopher apple		X															
Lindernia crustacea	Malaysian false pimpernel	X					**X**											**X**
Melinis repens	Natalgrass																	
Oldenlandia uniflora	Clustered millie graines		X															
Opuntia humifusa	Pricklypear		X															
Panicum anceps	Beaked panic grass		X															
Panicum rigidulum	Red-top panic grass	X			**X**		**X**											
Paspalum notatum	Bahia grass	X										**X**						
Paspalum setaceum	Thin paspalum	X	X				**X**							**X**	**X**	**X**		
Phytolacca americana	Common pokeweed																	

x = occurence within quadrat

TABLE 109: HERBACEOUS INVENTORY MATRIX - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T100-QN	T100-QS	T100-QE	T100-QW	T100-Add	T101-QN	T101-QS	T101-QE	T101-QW	T101-Add	T102-QN	T102-QS	T102-QE	T102-QW	T102-Add
Piloblephis rigida	Wild pennyroyal	X	X															
Pityopsis graminifolia	Narrowleaf silkgrass	X	X															X
Pluchea odorata	Sweetscent																	
Polypremum procumbens	Rustweed	X																
Pterocaulon pycnostachyum	Blackroot																	
Quercus geminata	Sand live oak		X		X	X								X			X	
Quercus pumila	Running oak																	
Rhus copallinum	Winged sumac		X															
Sabatia brevifolia	Shortleaf rosegentian	X																
Scoparia dulcis	Licorice weed	X					X											
Serenoa repens	Saw palmetto		X															X
Smilax auriculata	Earleaf greenbriar		X	X					X	X					X			
Smilax bona-nox	Saw greenbrier					X								X		X		
Solidago odorata var. chapmanii	Chapman's goldenrod		X	X		X								X				
Stillingia sylvatica	Queensdelight		X															
Syngonanthus flavidulus	Bantam-buttons																	
Tillandsia usneoides	Spanish moss																	
Tripsacum dactyloides	Fakahatchee grass		X															
Urena lobata	Caesarweed	X		X		X	X								X	X		
Vaccinium corymbosum	Highbush blueberry																	
Vaccinium myrsinites	Shiny blueberry		X											X		X		
Vaccinium stamineum	Deerberry																	
Vitis rotundifolia	Muscadine grape		X															
Yucca filamentosa	Adam's needle		X									X						
Totals		**19**	**34***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 110: HERBACEOUS INVENTORY MATRIX - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T97-QN	T97-QS	T97-QE	T97-QW	T97-Add	T98-QN	T98-QS	T98-QE	T98-QW	T98-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Cenchrus echinatus	Southern sandbur	X																
Eupatorium mohrii	Eupatorium	X																X
Helianthemum corymbosum	Pinebarren frostweed	X																
Hypericum cistifolium	Round-pod St. John's wort	X																
Hypoxis juncea	Yellow star grass	X																
Hypericum tetrapetalum	St. John's wort	X																
Utricularia subulata	Bladderwort	X																X
Aristida spiciformis	Pinebarren three-awn																	X
Berlandiera subacaulis	Florida greeneyes																	
Carphephorus odoratissimus	Pineland purple																	
Dichanthelium commutatum	Variable witchgrass																	
Digitaria serotina	Hairy crabgrass																	
Diospyros virginiana	Persimmon																	
Eupatorium rotundifolium	False hoarhound																	
Euthamia caroliniana	Slender goldenrod													X	X	X	X	
Juncus scirpoides	Needlepod rush																	
Liatris spicata	Dense gayfether																	
Ludwigia maritima	Seaside primrosewillow													X				
Persea borbonia	Red bay																	
Pteridium aquilinum	Bracken fern									X		X						
Pterocaulon pycnostachyum	Blackroot															X		
Quercus laurifolia	Laurel oak																	
Quercus nigra	Water oak																	
Quercus pumila	Running oak																	
Quercus virginiana	Live oak																	
Sabatia brevifolia	Shortleaf rosegentian																	
Smilax bona-nox	Saw greenbrier																	
Syngonanthus flavidulus	Bantam-buttons																	X
Vaccinium corymbosum	Highbush blueberry																	X
Andropogon ternarius	Splitbeard bluestem	X	X											X				
Andropogon virginicus	Broomsedge	X	X										X					X
Carphephorus corymbosus	Florida paintbrush	X	X													X		
Croton michauxii	Rushfoil	X	X															
Cyperus retrorsus	Pinebarren flatsedge	X	X										X					
Erucastrum gallicum	Common dogmustard	X	X															
Gratiola hispida	Rough hedgehyssop	X	X												X		X	
Liatris gracilis	Slender goldenrod	X	X											X				
Solidago odorata var. chapmanii	Chapman's goldenrod	X	X								X					X	X	
Tripsacum dactyloides	Fakahatchee grass	X	X															
Aristida stricta	Wiregrass		X											X	X	X	X	
Callicarpa americana	American beauty-berry		X															
Cyperus croceus	Baldwin flatsedge		X															
Dichanthelium aciculare	Needleleaf witchgrass		X															
Eragrostis elliottii	Elliot's lovegrass		X															X
Eragrostis spectabilis	Purple lovegrass		X															

x = occurence within quadrat

TABLE 110: HERBACEOUS INVENTORY MATRIX - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) MONITORING EVENT - NOVEMBER 2024
FOUR CORNERS MINE - SUWH
MU'S 15E, 16E, 17E, AND 19E

SCIENTIFIC NAME	COMMON NAME	FRUIT OR FLOWER	HCPMRM LISTED SPECIES	T97-QN	T97-QS	T97-QE	T97-QW	T97-Add	T98-QN	T98-QS	T98-QE	T98-QW	T98-Add	T99-QN	T99-QS	T99-QE	T99-QW	T99-Add
Eupatorium capillifolium	Dogfennel		X															
Eupatorium mohrii	Eupatorium		X															
Galactia elliotii	Milkpea		X															
Lechea deckertii	Deckert's pinweed		X															
Licania michauxii	Gopher apple		X															
Lyonia fruticosa	Coastplain Staggerbush		X															
Paspalum setaceum	Thin paspalum		X															
Piloblephis rigida	Wild pennyroyal		X															
Pityopsis graminifolia	Narrowleaf silkgrass		X															
Quercus geminata	Sand live oak		X															
Quercus laevis	Turkey oak		X															
Rhus copallinum	Winged sumac		X															
Serenoa repens	Saw palmetto		X											X	X	X	X	
Smilax auriculata	Earleaf greenbriar		X	X														
Vaccinium myrsinites	Shiny blueberry		X											X		X	X	
Vitis rotundifolia	Muscadine grape		X					X										
Yucca filamentosa	Adam's needle		X															
Bulbostylis barbata	Watergrass	X																
Chapmannia floridana	Florida alicia	X											X					
Polygala lutea	Orange milkwort	X																
Polypremum procumbens	Rustweed	X																
Urena lobata	Caesarweed	X						X	X									
Conyza canadensis	Dwarf horseweed																	
Dichanthelium acuminatum	Panic grass												X					
Fimbristylis dichotoma	Forked fimbry																	
Hieracium gronovii	Queen-devil																	
Imperata cylindrica	Cogon grass																	
Lepidium virginicum	Pepper grass												X					
Oenothera simulans	Southern beeblossom																	
	Totals	**22**	**33***															

* Total number of HCPMRM List Species observed since monitoring started

x = occurence within quadrat

TABLE 111: WILDLIFE UTILIZATION - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Accipiter cooperii	Cooper's hawk	Falconiformes	-	-	
Agelaius phoeniceus	Red-winged blackbird	Passeriformes	-	-	**
Anhinga anhinga	Anhinga	Pelecaniformes	-	-	
Antigone canadensis	Sandhill crane	Gruiformes	-[5]	-	
Aramus guarauna	Limpkin	Gruiformes	-	-	*
Ardea alba	Great egret	Ciconiiformes	-	-	**
Ardea herodias	Great blue heron	Ciconiiformes	-	-	
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Charadrius vociferous	Killdeer	Charadriiformes	-	-	**
Circus hudsonius	Northern harrier	Falconiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	**
Cyanocitta cristata	Blue jay	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Egretta caerulea	Little blue heron	Ciconiiformes	ST	-	
Egretta thula	Snowy egret	Ciconiiformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	
Eudocimus albus	White ibis	Ciconiiformes	-	-	
Falco sparverius	American kestrel	Falconiformes	-[6]	-	
Gallinago gallinago	Common snipe	Charadriiformes	-	-	
Gallinula chloropus	Common moorhen	Gruiformes	-	-	
Geothlypis trichas	Common yellowthroat	Passeriformes	-	-	**
Haliaeetus leucocephalus	Bald eagle	Falconiformes	-[7]	-[7]	
Hirundo rustica	Barn swallow	Passeriformes	-	-	*
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	
Leucophaeus atricilla	Laughing gull	Charadriiformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Melospiza georgiana	Swamp sparrow	Passeriformes	-	-	**
Melospiza melodia	Song sparrow	Passeriformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Mycteria americana	Wood stork	Ciconiiformes	FT	T	*
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Pelecanus erythrorhynchos	American white pelican	Pelecaniformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Platalea ajaja	Roseate spoonbill	Pelecaniformes	ST	-	*

TABLE 111: WILDLIFE UTILIZATION - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN (Continued)					
Avian Species Listed in Manual[(4)](continued)					
Plegadis falcinellus	Glossy ibis	Ciconiiformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	**
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga coronata	Yellow-rumped warbler	Passeriformes	-	-	*
Setophaga palmarum	Palm warbler	Passeriformes	-	-	**
Spatula discors	Blue-winged teal	Anseriformes	-	-	
Strix varia	Barred owl	Strigiformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	**
Tringa melanoleuca	Greater yellowlegs	Charadriiformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	**
Turdus migratorius	American robin	Passeriformes	-	-	*
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	**
Gallinago delicata	Wilson's snipe	Charadriiformes	-	-	*
Gallinula galeata	Common gallinule	Gruiformes	-	-	
Porphyrio martinica	Purple gallinule	Gruiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Agkistrodon piscivorus conanti	Florida water moccasin	Squamata	-	-	**
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Crotalus adamanteus	Eastern diamondback rattlesnake	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Pseudemys floridana	Florida cooter	Testudines	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Anaxyrus terrestris	Southern toad	Anura	-	-	*
Hyla cinerea	Green treefrog	Anura	-	-	
Lithobates grylio	Pig frog	Anura	-	-	
Lithobates sphenocephala	Southern leopard frog	Anura	-	-	

TABLE 111: WILDLIFE UTILIZATION - DRY PRAIRIE (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Felis rufus	Bobcat	Carnivora	-	-	
Lontra canadensis	River otter	Carnivora	-	-	
Mephitis mephitis	Striped skunk	Carnivora	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	**
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the sandhill crane could not be determined. The listed (State Threatened) subspecies (*Anitgone canadensis pratensis*) is a Florida resident year-round, whereas the unlisted subspecies (*Anitgone canadensis tabida*) is migratory and occurs in Florida from approximately October until March.

[6]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

[7]The bald eagle has been delisted from the FWC's list of threatened species and the FWS's Endangered Species Act; however this species is remains protected by F.A.C. 68A-16.002, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

TABLE 112: WILDLIFE UTILIZATION - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Accipiter cooperii	Cooper's hawk	Falconiformes	-	-	
Ardea alba	Great egret	Ciconiiformes	-	-	
Ardea herodias	Great blue heron	Ciconiiformes	-	-	
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Geothlypis trichas	Common yellowthroat	Passeriformes	-	-	*
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	**
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	**
Troglodytes aedon	House wren	Passeriformes	-	-	**
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	**
REPTILE					
Reptile Species Listed in Manual[(4)]					
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	**
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	*
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**

TABLE 112: WILDLIFE UTILIZATION - DRY PRAIRIE (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Lithobates grylio	Pig frog	Anura	-	-	
Lithobates sphenocephala	Southern leopard frog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Mephitis mephitis	Striped skunk	Carnivora	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	**
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	**
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 113: WILDLIFE UTILIZATION - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Chordeiles minor	Common nighthawk	Caprimulgiformes	-	-	
Circus hudsonius	Northern harrier	Falconiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	*
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryobates pubescens	Downy woodpecker	Piciformes	-	-	*
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Falco sparverius	American kestrel	Falconiformes	-[5]	-	
Hirundo rustica	Barn swallow	Passeriformes	-	-	*
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	*
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	**
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus major	Boat-tailed grackle	Passeriformes	-	-	*
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	**
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	**
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Crotalus adamanteus	Eastern diamondback rattlesnake	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Anaxyrus terrestris	Southern toad	Anura	-	-	*

TABLE 113: WILDLIFE UTILIZATION - DRY PRAIRIE (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Canis latrans	Coyote	Carnivora	-	-	*
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

TABLE 114: WILDLIFE UTILIZATION - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Accipiter cooperii	Cooper's hawk	Falconiformes	-	-	
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Circus hudsonius	Northern harrier	Falconiformes	-	-	*
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	**
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Elanoides forficatus	Swallow-tailed kite	Falconiformes	-	-	
Eudocimus albus	White ibis	Ciconiiformes	-	-	
Falco sparverius	American kestrel	Falconiformes	-[5]	-	
Haliaeetus leucocephalus	Bald eagle	Falconiformes	-[6]	-[6]	
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus major	Boat-tailed grackle	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	**
Spatula discors	Blue-winged teal	Anseriformes	-	-	
Strix varia	Barred owl	Strigiformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Turdus migratorius	American robin	Passeriformes	-	-	*
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	

TABLE 114: WILDLIFE UTILIZATION - PINE FLATWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
REPTILE					
Reptile Species Listed in Manual[4]					
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	*
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	
Trachemys scripta scripta	Yellow-bellied slider	Testudines	-	-	
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Lithobates sphenocephala	Southern leopard frog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[4]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	**
Felis rufus	Bobcat	Carnivora	-	-	
Mephitis mephitis	Striped skunk	Carnivora	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Sylvilagus palustris	Marsh rabbit	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

[6]The bald eagle has been delisted from the FWC's list of threatened species and the FWS's Endangered Species Act; however this species is remains protected by F.A.C. 68A-16.002, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

TABLE 115: WILDLIFE UTILIZATION - PINE FLATWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	**
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	**
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Strix varia	Barred owl	Strigiformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	**
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	*
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla cinerea	Green treefrog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[4]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 116: WILDLIFE UTILIZATION - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	**
Cyanocitta cristata	Blue jay	Passeriformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Falco sparverius	American kestrel	Falconiformes	-[5]	-	*
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	**
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	**
Zenaida macroura	Mourning dove	Columbiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	

TABLE 116: WILDLIFE UTILIZATION - PINE FLATWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

[5]Due to the time of year the survey was conducted, the subspecies, and therefore listed status, of the American kestrel could not be determined. The listed (State Threatened subspecies (*Falco sparverius paulus*) is a Florida resident year-round, whereas the unlisted subspecies (*Falco sparverius sparverius*) is migratory and occurs in Florida from approximately October until March

TABLE 117: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Circus hudsonius	Northern harrier	Falconiformes	-	-	*
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Cyanocitta cristata	Blue jay	Passeriformes	-	-	**
Megaceryle alcyon	Belted kingfisher	Coraciiformes	-	-	*
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	**
Vireo griseus	White-eyed vireo	Passeriformes	-	-	**
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[4]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	*
MAMMAL					
Mammal Species Listed in Manual[4]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	**
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	**
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 118: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[4]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	*
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
REPTILE					
Reptile Species Listed in Manual[4]					
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[4]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[4]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Procyon lotor	Raccoon	Carnivora	-	-	**
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 119: WILDLIFE UTILIZATION - TEMPERATE HARDWOODS (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Columbina passerina	Common ground dove	Columbiformes	-	-	**
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	**
Vireo griseus	White-eyed vireo	Passeriformes	-	-	**
Zenaida macroura	Mourning dove	Columbiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Agkistrodon piscivorus conanti	Florida water moccasin	Squamata	-	-	
Anolis carolinensis	Green anole	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	
Kinosternon subrubrum	Eastern mud turtle	Testudines	-	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
Hyla cinerea	Green treefrog	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	**
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 120: WILDLIFE UTILIZATION -XERIC OAK (RECLAMATION)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	**
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	**
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Lanius ludovicianus	Loggerhead shrike	Passeriformes	-	-	**
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Tachycineta bicolor	Tree swallow	Passeriformes	-	-	**
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Porphyrio martinica	Purple gallinule	Gruiformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 121: WILDLIFE UTILIZATION - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cardinalis cardinalis	Northern cardinal	Passeriformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	**
Colinus virginianus	Northern bobwhite	Galliformes	-	-	
Columbina passerina	Common ground dove	Columbiformes	-	-	**
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	**
Cyanocitta cristata	Blue jay	Passeriformes	-	-	**
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	**
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	**
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	
Polioptila caerulea	Blue-gray gnatcatcher	Passeriformes	-	-	
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	
Setophaga palmarum	Palm warbler	Passeriformes	-	-	**
Sturnella magna	Eastern meadowlark	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	
Troglodytes aedon	House wren	Passeriformes	-	-	**
Vireo griseus	White-eyed vireo	Passeriformes	-	-	**
Zenaida macroura	Mourning dove	Columbiformes	-	-	**
REPTILE					
Reptile Species Listed in Manual[(4)]					
Anolis carolinensis	Green anole	Squamata	-	-	
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
Reptile Species *Not* Listed in Manual					
Anolis sagrei	Brown anole	Squamata	-	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	**
Hyla cinerea	Green treefrog	Anura	-	-	

TABLE 121: WILDLIFE UTILIZATION - XERIC OAK (ENHANCEMENT)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Didelphis virginiana	Virginia opossum	Didelphimorphia	-	-	**
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Procyon lotor	Raccoon	Carnivora	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	**
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	**
Sus scrofa	Feral pig	Artiodactyla	-	-	

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

TABLE 122: WILDLIFE UTILIZATION - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
AVIAN					
Avian Species Listed in Manual[(4)]					
Baeolophus bicolor	Tufted titmouse	Passeriformes	-	-	
Buteo jamaicensis	Red-tailed hawk	Falconiformes	-	-	
Buteo lineatus	Red-shouldered hawk	Falconiformes	-	-	
Cathartes aura	Turkey vulture	Ciconiiformes	-	-	
Colinus virginianus	Northern bobwhite	Galliformes	-	-	*
Columbina passerina	Common ground dove	Columbiformes	-	-	
Coragyps atratus	Black vulture	Ciconiiformes	-	-	
Corvus brachyrhynchos	American crow	Passeriformes	-	-	
Dryobates pubescens	Downy woodpecker	Piciformes	-	-	*
Dryocopus pileatus	Pileated woodpecker	Piciformes	-	-	
Dumetella carolinensis	Gray catbird	Passeriformes	-	-	**
Melanerpes carolinus	Red-bellied woodpecker	Piciformes	-	-	*
Mimus polyglottos	Northern mockingbird	Passeriformes	-	-	
Passerculus sandwichensis	Savannah sparrow	Passeriformes	-	-	
Pipilo erythrophthalmus	Eastern towhee	Passeriformes	-	-	*
Quiscalus major	Boat-tailed grackle	Passeriformes	-	-	*
Quiscalus quiscula	Common grackle	Passeriformes	-	-	
Sayornis phoebe	Eastern phoebe	Passeriformes	-	-	*
Setophaga palmarum	Palm warbler	Passeriformes	-	-	
Thryothorus ludovicianus	Carolina wren	Passeriformes	-	-	*
Vireo griseus	White-eyed vireo	Passeriformes	-	-	
Zenaida macroura	Mourning dove	Columbiformes	-	-	
Avian Species *Not* Listed in Manual					
Bubulcus ibis	Cattle egret	Pelecaniformes	-	-	
REPTILE					
Reptile Species Listed in Manual[(4)]					
Coluber constrictor priapus	Southern black racer	Squamata	-	-	
Gopherus polyphemus	Gopher tortoise	Testudines	ST	-	**
AMPHIBIAN					
Amphibian Species Listed in Manual[(4)]					
Anaxyrus quercicus	Oak toad	Anura	-	-	

TABLE 122: WILDLIFE UTILIZATION - XERIC OAK (NATIVE AREA)
4TH ANNUAL (FALL) QUANTITATIVE MONITORING SURVEY
SIGNIFICANT UPLAND WILDLIFE HABITAT
NOVEMBER 2024

SCIENTIFIC NAME	COMMON NAME	ORDER[1]	FWC STATUS[2]	FWS STATUS[3]	OBSERVANCE (*,**)
MAMMAL					
Mammal Species Listed in Manual[(4)]					
Odocoileus virginianus	White-tailed deer	Artiodactyla	-	-	**
Sciurus carolinensis	Eastern gray squirrel	Rodentia	-	-	*
Procyon lotor	Raccoon	Carnivora	-	-	
Sylvilagus floridanus	Eastern cottontail	Lagomorpha	-	-	
Felis rufus	Bobcat	Carnivora	-	-	
Mammal Species *Not* Listed in Manual					
Dasypus novemcinctus	Nine-banded armadillo	Cingulata	-	-	
Sus scrofa	Feral pig	Artiodactyla	-	-	**

* Species observed for the first time.

** Species observed during the current monitoring survey.

[1]At time of Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM) publication, wading bird species were classified under Ciconiformes, but current taxonomy places them in Pelecaniformes. For compliance with the manual, the Ciconiformes classification is maintained, though the species are now recognized in Pelecaniformes.

[2]FWC - Florida Fish and Wildlife Conservation Commission; Official Lists of Florida's Endangered Species, Threatened Species, and Species of Special Concern (Ch. 68A-27 F.A.C.; updated 05/2023) [ranking: ST - State-designated Threatened, SSC - State Species of Special Concern, FE - Federally-designated Endangered, FT - Federally-designated Threatened, FT(S/A) - Federally-designated Threatened by Similarity of Appearance]

[3]FWS - U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species updated through the FWS web site - last updated on 10/25/2024. [ranking E - Endangered, T - Threatened, T(S/A) - Threatened by Similarity of Appearance]

[4]Species listed in the Hillsborough County Phospahte Mining Reclamation Manual (HCPMRM).

APPENDICES

APPENDIX A: PLANTING LISTS

FOUR CORNERS MINE SIGNIFICANT UPLAND WILDLIFE MONITORING

Planting Lists

TREES							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Acer rubrum	Red maple				+		+
Carpinus caroliniana	Musclewood						+
Carya glabra	Pignut hickory						+
Celtis laevigata	Hackberry					+	+
Cornus florida	Flowering dogwood						+
Diospyros virginiana	Persimmon				+	+	+
Juniperus virginiana	Southern red cedar						+
Liquidambar styraciflua	Sweetgum				+		+
Magnolia grandiflora	Southern magnolia						+
Morus rubra	Red mulberry						+
Myrica cerifera	Wax myrtle	+	+	+	+		+
Persea borbonia	Red bay						+
Pinus clausa	Sand pine		+	+			
Pinus elliottii	Slash pine	+			+		+
Pinus palustris	Longleaf pine	+	+	+	+	+	
Prunus caroliniana	Cherry laurel						+
Prunus serotina	Black cherry						+
Quercus geminata	Sand live oak		+	+		+	+
Quercus incana	Bluejack oak					+	
Quercus laevis	Turkey oak		+	+		+	
Quercus laurifolia	Laurel oak				+		+
Quercus nigra	Water oak				+		+
Quercus virginiana	Live oak	+			+		+
Sabal palmetto	Sabal palm	+			+		+
Tilia americana	Basswood						+
Zanthoxylum clava-herculis	Hercules-club					+	

Planting Lists

SHRUBS							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Amorpha fruticosa	False indigo bush						+
Ardisia escallonoides	Marlberry						+
Asimina angustifolia	Slimleaf pawpaw					+	
Asimina obovata	Large flowered pawpaw	+	+	+			
Asimina reticulata	Netted pawpaw	+	+	+	+	+	
Asimina triloba	Common pawpaw						+
Baccharis glomeruliflora	Silverling				+		+
Baccharis halimifolia	Groundsel tree	+			+		+
Bejaria racemosa	Tarflower	+	+	+	+		
Callicarpa americana	Beauty berry		+	+	+	+	+
Carya floridana	Scrub hickory		+	+		+	
Ceratiola ericoides	Florida rosemary		+	+		+	
Chionanthus pygmaeus	Pygmy fringe tree		+	+			
Chionanthus virginicus	White fringetree						+
Crataegus michauxii	Mixhaux's hawthorn					+	+
Erythrina herbacea	Coral bean		+	+	+	+	+
Euonymus americanus	American strawberrybush						+
Garberia heterophylla	Garberia		+	+		+	
Gaylussacia dumosa	Dwarf huckleberry	+	+	+	+		
Gaylussacia frondosa	Dangleberry	+			+		
Hypericum cistifolium	Roundpod St. John's wort				+		
Hypericum hypericoides	St. Andrew's cross				+		+
Hypericum mutilum	Myrtleleaf St. John's wort				+		
Hypericum reductum	Atlantic St. John's wort	+	+	+			
Hypericum tetrapetalum	St. Andrew's cross	+			+		
Ilex ambigua	Sand holly		+	+		+	
Ilex glabra	Gallberry	+	+	+	+		
Lyonia ferruginea	Rusty lyonia		+	+	+		
Lyonia fruticosa	Staggerbush	+	+	+	+		
Lyonia lucida	Shiny lyonia	+	+	+	+		
Osmanthus megacarpus	Scrub tea olive		+	+		+	
Photinia pyrifolia	Red chokeberry				+		
Prunus angustifolia	Chickasaw plum						+
Prunus umbellata	Flatwoods plum		+	+	+	+	+
Quercus chapmanii	Chapman oak	+	+	+		+	
Quercus inopina	Scrub oak		+	+			
Quercus minima	Dwarf live oak	+	+	+	+		
Quercus myrtifolia	Myrtle oak	+	+	+		+	
Quercus pumila	Runner oak	+			+		
Rhus copallinum	Shining sumac		+	+	+	+	
Serenoa repens	Saw palmetto	+	+	+	+	+	+
Sideroxylon reclinatum	Florida bully				+		
Sideroxylon tenax	Tough bumeilia		+	+		+	
Styrax americana	Storax						+
Vaccinium arboreum	Sparkleberry		+	+	+		
Vaccinium corymbosum	Highbush blueberry						+
Vaccinium darrowii	Little blueberry		+	+		+	
Vaccinium myrsinites	Shiny blueberry	+	+	+	+	+	
Vaccinium stamineum	Deerberry				+	+	
Viburnum obovatum	Walter's viburnum						+
Ximenia americana	Hog plum		+	+	+	+	+

Planting Lists

HERBS							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Acalypha graciliens	Slender threeseed mercury	+			+	+	+
Agalinis fasciculata	Beach false foxglove	+	+	+	+	+	
Agalinis filifolia	Seminole false foxglove	+	+	+	+	+	
Agalinis obtusifolia	Tenlobe false foxglove				+		
Ageratina jucunda	Hammock snakeroot					+	
Aletris lutea	Yellow colic-root	+			+		
Ambrosia artemisiifolia	Common ragweed	+	+	+	+	+	+
Ampelopsis arborea	Peppervine						+
Amphicarpum muhlenbergianum	Blue maidencane	+			+		
Andropogon brachystachyus	Short-spike bluestem	+			+		
Andropogon floridanus	Florida bluestem		+	+			
Andropogon glomeratus	Big chalky bluestem	+			+		
Andropogon gyrans	Elliott's bluestem	+			+	+	
Andropogon ternarius	Splitbeard bluestem	+	+	+	+	+	
Andropogon virginicus	Bluestem	+		+	+	+	+
Apios americana	Groundnut						+
Aristida gyrans	Corkscrew threeawn		+	+		+	
Aristida patula	Tall threeawn	+			+		
Aristida purpurascens	Slim-spike threeawn	+	+	+	+	+	
Aristida spiciformis	Bottlebrush threeawn	+			+		
Aristida stricta	Wiregrass	+	+	+	+	+	
Aristolochia serpentaria	Virginia snakeroot					+	+
Arnoglossum floridanum	Florida Indian plantain		+	+		+	
Asclepias connivens	Largeflower milkweed				+		
Asclepias curtissii	Curtiss' milkweed		+	+			
Asclepias feayi	Florida milkweed	+			+		
Asclepias humistrata	Sandhill milkweed			+		+	
Asclepias lanceolata	Fewflower milkweed				+		
Asclepias pedicellata	Savannah milkweed	+			+		
Asclepias perennis	Swamp milkweed				+		
Asclepias tomentosa	Velvetleaf milkweed					+	
Asclepias tuberosa	Butterflyweed		+	+	+	+	
Asclepias verticillata	Whorled milkweed	+			+	+	
Axonopus fissifolius	Common carpetgrass	+			+		
Axonopus furcatus	Big carpetgrass	+			+		
Balduina angustifolia	Yellow buttons	+	+	+	+	+	
Baptisia lanceolata	Gopher weed					+	
Baptisia lecontei	Pineland wild indigo					+	
Berchemia scandens	Rattan vine				+		+
Berlandiera subacaulis	Greeneyes					+	
Bidens alba	Beggarticks	+	+	+	+	+	+
Bidens bipinnata	Spanish needles				+	+	+
Bigelowia nudata	Pineland rayless goldenrod	+			+		
Bonamia grandiflora	Florida bonamia		+	+			
Buchnera americana	Bluehearts	+	+	+	+		+
Bulbostylis ciliatifolia	Capillary hairsedge	+	+	+	+	+	
Bulbostylis warei	Ware's hairsedge		+	+	+	+	
Callisia ornata	Roseling	+	+	+	+	+	
Calopogon barbatus	Bearded grasspink	+			+		

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Calopogon multiflorus	Manyflowered grasspink	+			+		
Campsis radicans	Trumpet creeper						+
Carex longii	Long's sedge	+			+		+
Carphephorus carnosus	Starclusters	+			+		
Carphephorus corymbosus	Florida paintbrush	+	+	+	+	+	
Carphephorus odoratissimus	Pineland purple	+				+	
Carphephorus paniculatus	Deertongue	+			+		
Cenchrus echinatus	Southern sandspur					+	
Cenchrus gracillimus	Slender sandspur				+	+	
Centella asiatica	Coinwort	+			+		+
Centrosema virginianum	Butterfly pea			+		+	+
Chamaecrista fasciculata	Partridge pea	+	+	+	+	+	+
Chamaecrista nictitans	Sensitive partridge pea	+			+	+	+
Chapmannia floridana	Chapman's pea	+	+	+	+	+	
Chaptalia tomentosa	Pineland daisy	+			+		
Chasmanthium laxum	Longleaf chasmanthium						+
Chrysopis floridana	Florida goldenaster		+	+			
Chrysopsis scabrella	Golden aster			+		+	
Chrysopsis subulata	Scrubland goldenaster		+	+	+		
Clematis reticulata	Netleaf leather flower						+
Clitoria mariana	Butterfly pea	+	+	+	+	+	+
Cnidoscolus stimulosus	Tread softly	+	+	+	+	+	
Coelorachis cylindrica	Carolina jointtailgrass	+				+	+
Coelorachis rugosa	Wrinkled jointtailgrass	+				+	
Commelina diffusa	Dayflower						+
Commelina erecta	Dayflower	+	+	+	+	+	
Conoclinium coelestinum	Blue mistflower	+			+	+	+
Coreopsis floridana	Florida tickseed	+			+		
Coreopsis leavenworthii	Leavenworth's tickseed	+			+		
Crotalaria rotundifolia	Rabbit bells	+	+	+	+	+	
Croton argyranthemus	Silver croton					+	
Croton glandulosus	Croton					+	
Croton michauxii	Rushfoil		+	+	+	+	
Ctenium aromaticum	Toothache grass	+			+		
Cyperus articulatus	Jointed flatsedge				+		
Cyperus compressus	Poorland flatsedge	+			+		
Cyperus croceus	Baldwin's flatsedge	+	+	+	+	+	+
Cyperus cuspidatus	Coastalplain flatsedge	+			+		
Cyperus flavescens	Yellow flatsedge				+		
Cyperus odoratus	Fragrant flatsedge				+		
Cyperus polystachyos	Manyspike flatsedge	+	+	+	+	+	+
Cyperus retrorsus	Pinebarren flatsedge	+	+	+	+	+	+
Cyperus stenolepis	Strawcolored flatsedge				+		
Cyperus strigosus	Strawcolored flatsedge				+		
Cyperus surinamensis	Tropical flatsedge				+		
Cyperus tetragonus	Fourangle flatsedge						
Dalea feayi	Feay's prairie clover		+	+		+	
Dalea pinnata	Summer farewell		+	+		+	
Desmodium floridanum	Florida ticktrefoil					+	

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Desmodium incanum	Creeping beggarweed	+			+	+	+
Desmodum paniculatum	Panicledleaf ticktrefoil						+
Dichanthelium aciculare	Needlwleaf witchgrass	+	+	+	+	+	
Dichanthelium ensifolium	Witchgrass	+	+	+	+	+	
Dichanthelium laxiflorum	Openflower witchgrass					+	+
Dichanthelium leucothrix	Witchgrass	+			+		
Dichanthelium portoricense	Witchgrass	+	+	+	+	+	+
Dichanthelium strigosum	Witchgrass	+			+		+
Dichondra caroliniensis	Carolina ponysfoot				+		
Digitaria ciliaris	Southern crabgrass	+	+	+	+	+	+
Digitaria filiformis	Slender crabgrass	+	+	+	+	+	
Digitaria serotina	Blanket crabgrass	+			+		+
Diodia virginiana	Virginian buttonweed	+			+		
Drosera brevifolia	Dwarf sundew	+			+		
Drosera capillaris	Pink sundew	+			+		
Drymaria cordata	Drymaria						+
Dyschoriste oblongifolia	Twinflower	+			+	+	
Eclipta prostrata	False daisy				+		
Eleocharis baldwinii	Baldwin's spikerush	+			+		
Eleocharis spp.	Spikerushes	+			+		
Elephantopus elatus	Elephant's foot	+		+	+	+	+
Encyclia tampensis	Florida butterfly orchid			+			+
Epidendrum conopseum	Green-fly orchid						+
Eragrostis elliottii	Elliott's lovegrass	+	+	+	+	+	+
Eragrostis hypnoides	Teal lovegrass						
Eragrostis spectabilis	Purple lovegrass	+	+	+	+	+	+
Eragrostis virginica	Meadow lovegrass	+	+	+	+	+	+
Erechtites hieracifolius	Fireweed	+			+	+	+
Erigeron quercifolius	Oakleaf fleabane	+			+		+
Erigeron vernus	Fleabane	+			+		
Eriogonum tomentosum	Wild buckwheat			+		+	
Eryngium aromaticum	Fragrant eryngium	+	+	+	+		
Eryngium yuccifolium	Button snakeroot	+			+		
Eulophia alta	Wild coco	+			+		
Eupatorium capillifolium	Dogfennel	+	+	+	+		+
Eupatorium compositifolium	Yankeeweed				+		
Eupatorium leptophyllum	Falsefennel	+			+		
Eupatorium mohrii	Mohr's hoarhound	+			+		
Eupatorium rotundifolium	False hoarhound	+			+		
Euphorbia polyphylla	Lesser Florida spruge	+	+	+	+		
Eustachys glauca	Saltmarsh fingergrass	+			+	+	
Eustachys petraea	Pinewoods fingergrass	+	+	+	+	+	+
Euthamia caroliniana	Flat-topped goldenrod	+			+		
Fimbristylis autumnalis	Slender fimbry	+			+		
Fimbristylis puberula	Hairy fimbry	+			+		
Froelichia floridana	Cottonweed	+	+	+	+	+	
Fuirena breviseta	Saltmarsh umbrellasedge	+			+		
Gaillardia aestivalis	Lanceleaf blanketflower					+	
Galactia elliottii	Elliott's milkpea	+	+	+	+	+	+

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Galactia regularis	Florida milkpea	+	+	+	+	+	+
Galactia volubilis	Downy milkpea	+			+		+
Galium hispidulum	Coastal bedstraw						+
Galium pilosum	Hairy bedstraw						+
Gamochaeta falcata	Narrowleaf purple everlasting	+			+		+
Gamochaeta pensylvanica	Pennsylvania everlasting	+			+		+
Gelsemium sempervirens	Carolina jessamine				+	+	+
Glandularia tampensis	Tampa mock vervain				+		+
Gratiola hispida	Rough hedge-hyssop	+	+	+	+		
Gratiola pilosa	Shaggy hedge-hyssop	+			+		
Gratiola ramosa	Branching hedge-hyssop	+			+		
Gymnopogon ambiguus	Bearded skeletongrass					+	
Gymnopogon chapmanianus	Chapman’s skeletongrass	+			+		
Habenaria floribunda	Toothpetal false reinorchid				+		+
Habenaria nivea	Snowy orchid				+		
Habenaria quinqueseta	Longhorn false reinorchid				+		
Habenaria repens	Waterspider false reinorchid				+		
Helenium amarum	Bitterweed	+	+	+	+	+	+
Helenium flexuosum	Purplehead sneezeweed				+		
Helianthemum corymbosum	Clustered rockrose	+			+	+	
Helianthemum nashii	Florida scrub frostweed		+	+	+		
Helianthus agrestis	Southeastern sunflower				+		
Helianthus angustifolius	Narrow-leaved sunflower	+			+		
Helianthus radula	Rayless sunflower	+			+		
Heterotheca subaxillaris	Camphorweed		+	+	+	+	
Hieracium megacephalon	Hawks beard	+		+	+	+	
Hydrocotyle umbellata	Water pennywort	+			+		+
Hydrolea corymbosa	Skyflower				+		
Hypericum gentianoides	Pineweeds				+		
Hypericum mutilum	Dwarf St. John's-wort				+		
Hypoxis curtissii	Common yellow stargrass						+
Hypoxis juncea	Yellow stargrass	+			+		
Hyptis alata	Musky mint	+			+		+
Indigofera caroliniana	Carolina indigo			+		+	
Ipomoea alba	Moonflower						+
Ipomoea cordatotriloba	Tievine	+	+	+	+	+	+
Ipomoea hederifolia	Scarletcreeper	+	+	+	+	+	+
Ipomoea pandurata	Man-of-the-earth						+
Juncus dichotomus	Forked rush	+			+		
Juncus effusus	Soft rush				+		
Juncus elliottii	Elliott's rush				+		
Juncus marginatus	Grassleaf rush	+			+		
Juncus megacephalus	Bighead rush				+		
Juncus polycephalos	Manyhead rush				+		
Juncus scirpoides	Needlepod rush	+			+		
Krameria lanceolata	Sandbur			+		+	
Krigia virginica	Dwarf dandelion	+			+	+	
Lachnanthes caroliniana	Redroot	+			+		
Lachnocaulon anceps	Bog buttons	+			+		

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Lachnocaulon minus	Small's bogbutton	+			+		
Lactuca floridana	Woodland lettuce						+
Lechea cernua	Nodding pinweed		+	+			
Lechea deckertii	Deckert's pinweed		+	+			
Lechea divaricata	Spreading pinweed		+	+			
Lechea torreyi	Piedmont pinweed	+		+	+		
Lespedeza hirta	Hairy bush clover					+	
Liatris chapmanii	Chapman's blazing star		+	+		+	
Liatris garberi	Garber's blazing star	+			+		
Liatris gracilis	Slender blazing star	+	+	+	+	+	
Liatris spicata	Spiked blazing star	+			+		
Liatris tennuifolia	Shortleaf blazing star	+	+	+	+	+	
Licania michauxii	Gopher apple	+	+	+	+	+	
Lilium catesbaei	Pine lily	+			+		
Lindernia dubia	Yellowseed false pimpernel				+		
Lindernia grandiflora	Savannah false pimpernel				+		
Linum medium	Stiff yellow flax	+			+		
Lobelia glandulosa	Glades lobelia	+			+		
Lobelia paludosa	White lobelia	+			+		
Ludwigia arcuata	Piedmont seedbox				+		
Ludwigia maritima	Seaside primrose willow	+			+		
Ludwigia microcarpa	Smallfruit seedbox				+		
Ludwigia palustris	Marsh seedbox				+		
Ludwigia repens	Creeping seedbox	+			+		
Ludwigia suffruticosa	Shrubby primrose willow	+			+		
Lupinus diffusus	Skyblue lupine		+	+		+	
Luziola fluitans	Southern watergrass						
Lygodesmia aphylla	Roserush	+			+	+	
Lythrum alatum	winged loosestrife				+		
Matelea pubiflora	Trailing milkvine					+	
Matelea gonocarpos	Angularfruit milkvine						+
Melothria pendula	Creeping cucumber						+
Mikania cordifolia	Florida keys hempvine						+
Mimosa quadrivalis	Sensitive briar	+	+	+	+	+	
Mitchella repens	Partidgeberry						+
Mitreola sessifolia	Miterwort	+			+		
Monotropa uniflora	Indianpipe		+	+			
Muhlenbergia capillaris	Muhly grass	+			+	+	
Oldenlandia uniflora	Clustered diamond-flower	+	+	+	+	+	+
Onosmodium virginianum	Fall gromwell					+	
Ophioglossum crotalophoroides	Bulbous adder's-tongue				+		
Ophioglossum palmatum	Hand fern						
Ophioglossum petiolatum	Stalked adder's tongue				+		
Oplismenus hirtellus	Basketgrass						+
Opuntia humifusa	Prickly pear	+	+	+	+	+	
Opuntia stricta	Prickly pear					+	
Oxalis corniculata	Common yellow woodsorrel	+			+	+	+
Oxypolis filiformis	Water dropwort	+			+		
Palafoxia feayi	Feay's palafox		+	+	+	+	

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Palafoxia integrifolia	Coastalplain palafox	+	+	+	+	+	
Panicum anceps	Beaked panicum	+	+	+	+	+	+
Panicum hemitomon	Maidencane	+	+	+	+	+	+
Panicum hians	Gaping panic grass	+			+		
Panicum longifolium	Panic grass	+			+		
Panicum rigidulum	Redtop panicum				+		
Panicum tenerum	Bluejoint panicum				+		
Panicum verrucosum	Warty panic grass	+			+		
Panicum virgatum	Switch grass	+			+		
Parthenocissus quinquefolia	Virginia creeper						+
Paspalum caespitosum	Blue crowngrass	+			+	+	+
Paspalum conjugatum	Sour paspalum						+
Paspalum floridanum	Florida paspalum				+		+
Paspalum laeve	Field paspalum	+			+		
Paspalum praecox	Early paspalum	+			+		
Paspalum setaceum	Thin paspalum	+	+	+	+	+	+
Passiflora incarnata	Passion flower		+	+		+	
Penstemon australis	Pink					+	
Penstemon multiflorus	Manyflower beardtongue		+	+		+	
Phlebodium aureum	Golden polypody				+		+
Phoebanthus grandiflorus	Phoebanthus	+	+	+	+	+	
Phyla nodiflora	Fogfruit	+			+		
Physalis arenicola	Ground cherry					+	
Physostegia purpurea	Purple dragonhead	+			+		
Piloblephis rigida	Pennyroyal	+	+	+	+	+	
Pinguicula lutea	Yellow butterwort	+			+		
Pinguicula pumila	Small butterwort	+			+		
Piriqueta caroliniana	Piriqueta	+	+	+	+	+	
Pityopsis graminifolia	Silver-leaved goldenaster	+	+	+	+	+	
Pleopeltis polypodioides	Resurrection fern						+
Pluchea rosea	Rosy camphor weed	+			+		
Polanisia tenuifolia	Pineland catchfly		+	+		+	
Polygala cruciata	Drumheads	+			+		
Polygala lutea	Orange milkwort	+			+		
Polygala rugelii	Yellow milkwort	+			+		
Polygala setacea	Coastalplain milkwort	+			+		
Polygala spp.	Milkworts	+			+		
Polygonella ciliata	Hairy jointweed		+	+			
Polygonella gracilis	Tall jointweed		+	+		+	
Polygonella polygama	October flower	+	+	+			
Polygonella robusta	Sandhill wireweed		+	+		+	
Polygonum punctatum	Dotted smartweed	+			+		
Polygonum hydropiperoides	Swamp smartweed	+			+		
Proserpinaca palustris	Marsh mermaidweed				+		
Pseudognaphalium obtusifolium	Rabbit tobacco	+	+	+	+	+	
Psilotum nudum	Whisk fern						+
Psychotria nervosa	Wild coffee						+
Psychotria sulzneri	Shortleaf wild coffee						+
Pteridium aquilinum	Bracken fern	+			+	+	+

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Pterocaulon pycnostachyum	Blackroot	+			+	+	
Pteroglossaspis ecristata	Giant orchid	+	+	+	+		
Rapanea punctata	Myrsine						+
Rhexia cubensis	Meadowbeauty	+			+		
Rhexia mariana	Pale meadow-beauty	+			+		
Rhexia nashii	Meadowbeauty	+			+		
Rhexia nuttallii	Meadowbeauty	+			+		
Rhexia petiolata	Meadowbeauty	+			+		
Rhynchosia michauxii	Michaux's rhynchosia			+		+	
Rhynchosia reniformis	Dollar weed			+		+	
Rhynchospora caduca	Anglestem beaksedge				+		
Rhynchospora ciliaris	Fringed beaksedge	+			+		
Rhynchospora colorata	Starrush	+			+		
Rhynchospora divergens	Spreading beaksedge				+		
Rhynchospora fascicularis	Fascicled beaksedge	+			+		
Rhynchospora fernaldii	Fernald's beaksedge	+			+		
Rhynchospora filifolia	Threadleaf beaksedge				+		
Rhynchospora globularis	Globe beakrush				+		
Rhynchospora intermedia	Pinebarren beaksedge	+	+	+	+	+	
Rhynchospora latifolia	Giant whitetop				+		
Rhynchospora megalocarpa	Sandyfield beaksedge		+	+		+	
Rhynchospora microcarpa	Southern beaksedge	+			+		
Rhynchospora microcephala	Bunched beaksedge	+			+		
Rhynchospora nitens	Shortbeak beaksedge				+		
Rhynchospora plumosa	Plumed beaksedge	+			+		
Rhynchospora spp.	Beaksedges	+	+	+	+	+	+
Rubus argutus	Sawtooth blackberry				+		+
Rubus cuneifolius	Sand blackberry				+	+	
Rubus trivialis	Dewberry	+	+		+		
Ruellia caroliniensis	Carolina wild petunia		+	+		+	+
Sabatia brevifolia	White sabatia	+			+		
Sabatia grandiflora	Large-flower marsh pink	+			+		
Saccharum giganteum	Sugarcane plumegrass				+		
Sacciolepis striata	Cupscale	+			+		
Salvia azurea	Blue sage			+	+	+	+
Salvia lyrata	Lyre-leaved sage						+
Samolus valerandi	Pineland pimpernel				+		
Sarracenia minor	Hooded pitcher plant	+			+		
Saururus cernuus	Lizard's tail						
Schizachyrium scoparium	Little bluestem	+	+	+	+	+	
Schwalbea americana	Chaffseed				+	+	
Scleria ciliata	Nutrush	+		+	+	+	
Scleria georgiana	Nutrush	+			+		
Scleria reticularis	Nutrush	+			+		
Scleria triglomerata	Nutrush	+			+		
Scleria verticillata	Low nutrush				+		
Scoparia dulcis	Sweetbroom	+			+	+	+
Scutellaria arenicola	Skullcap			+		+	
Scutellaria integrifolia	Helmet skullcap	+			+	+	+

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Selaginella arenicola	Sand spikemoss		+	+		+	
Sesbania herbacea	Danglepod				+		
Sesbania punicea	Rattlebox				+		
Setaria parviflora	Knotroot foxtail	+			+	+	
Seymeria pectinata	Piedmont blacksenna		+	+		+	
Sida acuta	Common fanpetals	+			+	+	+
Sida rhombifolia	Cuban jute	+			+	+	+
Sisyrinchium angustifolium	Blue-eyed grass	+			+		+
Sisyrinchium xerophyllum	Scrub blue-eyed grass		+	+		+	
Smilax auriculata	Greenbrier	+	+	+	+	+	+
Smilax bona-nox	Saw greenbriar					+	+
Smilax glauca	Cat greenbrier				+	+	+
Smilax laurifolia	Laurel greenbriar				+		
Smilax pumila	Sarsaparilla vine			+		+	+
Smilax smallii	Lanceleaf greenbrier						+
Solidago canadensis	Canada goldenrod						+
Solidago fistulosa	Goldenrod	+			+		+
Solidago odora	Chapman’s goldenrod	+	+	+	+	+	
Solidago stricta	Slender goldenrod	+			+	+	
Sorghastrum secundum	Lopsided indiangrass	+		+	+	+	
Spartina bakeri	Sand cordgrass	+			+		
Sporobolus junceus	Pineland dropseed			+		+	
Stillingia sylvatica	Queen’s delight	+	+	+	+	+	
Stipulicida setacea	Pineland scalypink		+	+		+	
Stylisma patens	Coastalplain dawnflower			+	+	+	
Symphyotrichum dumosum	Bush aster	+			+		+
Symphyotrichum subulatum	Annual saltmarsh aster				+	+	
Syngonanthus flavidulus	Bantam buttons	+			+		
Tephrosia chrysophylla	Scurf hoarypea		+	+		+	
Tephrosia hispidula	Spreading hoary-pea	+		+	+	+	
Thalia geniculata	Alligator flag						
Thelypteris dentata	Downy maiden fern				+		+
Thelypteris hispidula	Hairy maiden fern						+
Thelypteris kunthii	Southern shield fern						+
Thelypteris resinifera	Glandular maiden fern						+
Tillandsia bartramii	Bartram's airplant						+
Tillandsia fasciculata	Cardinal airplant						+
Tillandsia recurvata	Ball moss		+	+	+	+	+
Tillandsia setacea	Southern needleleaf		+	+	+	+	+
Tillandsia usneoides	Spanish moss				+	+	+
Tillandsia utriculata	Giant airplant			+	+	+	+
Toxicodendron radicans	Eastern poison ivy						+
Trichostema dichotomum	Blue curls		+	+		+	
Triplasis purpurea	Purple sandgrass		+	+		+	
Tripsacum dactyloides	Eastern gamagrass						+
Utricularia spp.	Bladderpod				+		
Utricularia subulata	Zigzag bladderwort	+			+		
Verbesina virginica	White crownbeard						+

Planting Lists

HERBS (continued)							
Species	**Common**	**DP**	**SP**	**XO**	**PF**	**SH**	**TH**
Viola lanceolata	Lanceleaf violet	+			+		
Viola palmata	Southern coast violet	+			+	+	
Viola sororia	Common blue violet						+
Vitis aestivalis	Summer grape						+
Vitis rotundifolia	Muscadine grape		+	+	+	+	+
Vitis shuttleworthii	Calloose grape				+	+	+
Vittaria lineata	Shoestring fern						+
Xyris ambigua	Yellow-eyed grass	+			+		
Xyris brevifolia	Yellow-eyed grass	+			+		
Xyris caroliniana	Yellow-eyed grass	+			+		
Xyris elliottii	Yellow-eyed grass	+			+		
Xyris platylepis	Yellow-eyed grass	+			+		
Xyris spp.	Yellow-eyed grass				+		
Yucca filamentosa	Beargrass	+	+	+	+	+	
Zamia pumila	Coontie				+		+
Zephyranthes atamasca	Treat's zephyrlily				+		
Zephyranthes simpsonii	Simpson's zephyrlily				+		

APPENDIX B: PHOTOGRAPHIC DOCUMENTATION
FOUR CORNERS MINE: SUWH – MUs, 15E, 16E, 17E and 19E

SPRING

Photo Station 01: - Facing North



Photo Station 01: Facing East



Photo Station 01: Facing South



Photo Station 01: Facing West



Photo Station 02: Facing North



Photo Station 02: Facing East



Photo Station 02: Facing South



Photo Station 02: Facing West



Photo Station 03: Facing North



Photo Station 03: Facing East



Photo Station 03: Facing South



Photo Station 03: Facing West



Photo Station 04: Facing North



Photo Station 04: Facing East



Photo Station 04: Facing South



Photo Station 04: Facing West



Photo Station 05: Facing North



Photo Station 05: Facing East



Photo Station 05: Facing South



Photo Station 05: Facing West



Photo Station 06: Facing North



Photo Station 06: Facing East



Photo Station 06: Facing South



Photo Station 06: Facing West



Photo Station 07: Facing North



Photo Station 07: Facing East



Photo Station 07: Facing South



Photo Station 07: Facing West



Photo Station 08: Facing North



Photo Station 08: Facing East



Photo Station 08: Facing South



Photo Station 08: Facing West



Photo Station 09: Facing North



Photo Station 09: Facing East



Photo Station 09: Facing South



Photo Station 09: Facing West



Photo Station 10: Facing North



Photo Station 10: Facing East



Photo Station 10: Facing South



Photo Station 10: Facing West



Photo Station 11: Facing North



Photo Station 11: Facing East



Photo Station 11: Facing South



Photo Station 11: Facing West



Photo Station 12: Facing North



Photo Station 12: Facing East



Photo Station 12: Facing South



Photo Station 12: Facing West



Photo Station 13: Facing North



Photo Station 13: Facing East



Photo Station 13: Facing South



Photo Station 13: Facing West



Photo Station 14: Facing North



Photo Station 14: Facing East



Photo Station 14: Facing South



Photo Station 14: Facing West



FALL

Photo Station 01: - Facing North



Photo Station 01: Facing East



Photo Station 01: Facing South



Photo Station 01: Facing West



Photo Station 02: Facing North



Photo Station 02: Facing East



Photo Station 02: Facing South



Photo Station 02: Facing West



Photo Station 03: Facing North



Photo Station 03: Facing East



Photo Station 03: Facing South



Photo Station 03: Facing West



Photo Station 04: Facing North



Photo Station 04: Facing East



Photo Station 04: Facing South



Photo Station 04: Facing West



Photo Station 05: Facing North



Photo Station 05: Facing East



Photo Station 05: Facing South



Photo Station 05: Facing West



Photo Station 06: Facing North



Photo Station 06: Facing East



Photo Station 06: Facing South



Photo Station 06: Facing West



Photo Station 07: Facing North



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Photo Station 13: Facing North



Photo Station 13: Facing East



Photo Station 13: Facing South



Photo Station 13: Facing West



Photo Station 14: Facing North



Photo Station 14: Facing East



Photo Station 14: Facing South



Photo Station 14: Facing West



ENVIRONMENTAL REPORT

Hillsborough County DRI 263 Environmental Monitoring
Four Corners, Kingsford, and Lonesome Mining Facilities
2024-2025 Report Period

Per current DRI 263 requirements, the following environmental monitoring summary covers the reporting period of July 1, 2024, through June 30, 2025, for Hillsborough County.

RAINFALL

Six (6) gauges located throughout Hillsborough County measure daily rainfall. The data is downloaded monthly and recorded. The rainfall summary provided in this report is based on these records. Rainfall recorded at each rain gauge was higher than the previous reporting period. The SE Hillsborough No.2 rain gauge malfunctioned from 3/14/25 – 4/15/25 and the data was unable to be recovered for that time period.

GROUNDWATER PUMPING

Withdrawal quantities for operation of Four Corners Mine are authorized by the current Water Use Permit No. 2011400. There were no exceedances of the authorized groundwater withdrawal quantities during the reporting period.

GROUNDWATER QUALITY

Groundwater sampling was conducted monthly within the Floridan aquifer. The groundwater sampling locations are either at FCO-P1 or at FCO-D1 (this is to provide flexibility based on operational constraints; both wells are adjacent to each other and provide similar results based on well depth installation).

Water quality measured at both Floridan aquifer monitoring locations was consistent throughout the reporting period with concentrations for all parameters at or below applicable groundwater standards. This data is consistent with results observed in previous reporting periods.

SURFICIAL WATER TABLE MONITORING

Groundwater level monitoring for the reporting year was completed at the Four Corners and Lonesome mining facilities.

The following areas are designated to fulfill requirements of the groundwater table monitoring and mitigation plan:

- Mining Units 12 & 14
- Mining Unit16E
- West Hillsborough
- West Hillsborough Extension
- DRI 263
- Mining Unit18
- Mining Unit 19
- Mining Unit 20
- Mining Unit 20E

- Doyen Property
- Hillsborough County Lonesome
- Lonesome
- Mining Unit 21
- Mining Unit 22

Groundwater elevation data collected at the areas designated above were generally consistent throughout the reporting period, including seasonal fluctuations. Water table monitoring is included in the current Water Use Permit (WUP No. 2011400.029). Four Corners, Lonesome, and Kingsford Mines are currently in compliance with the water table monitoring requirements per WUP No. 2011400.029.

Hillsborough County has been copied on all correspondence with Southwest Florida Water Management District concerning the monitoring of the water table in Hillsborough County during the reporting year. Therefore, to reduce duplication a list of this data is not included with the current submittal.

INDUSTRIAL WASTEWATER DISCHARGE AND WATER QUALITY

There are four (4) permitted industrial wastewater discharge points within the Hillsborough County Mining area.

NPDES Permit	Facility	Outfall No.	Status
FL0033332	Lonesome	D-002	Active
FL0033332	Lonesome	D-003	Active
FL0036412	Four Corners	D-001	Active
FL0036412	Four Corners	D-003	Active

Lonesome Mine Outfall Discharge and Water Quality

The Lonesome D-002 Outfall discharges excess mine recirculation water and storm water into the South Prong of the Alafia River (Class III Fresh Waters). The Lonesome D-003 Outfall discharges excess mine recirculation water and storm water into Hurrah Creek, a tributary of the South Prong of the Alafia River (Class III Fresh waters). The Lonesome D-002 outfall discharged from 8/5/2024 through 11/23/24. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. The Lonesome D-003 outfall did not discharge during the reporting period.

Four Corners Mine Outfall Discharge and Water Quality

The Four Corners D-001 Outfall discharges excess mine recirculation water and storm water into Alderman Creek, a tributary of the Little Manatee River (Class III Fresh waters). The Four Corners D-003 Outfall discharges excess mine recirculation water and storm water into an unnamed tributary (WBID #1770) of Howard Prairie Branch, a tributary of the Little Manatee River (Class III Fresh waters). The Four Corners D-001 outfall discharged from 8/7/2024 through 10/25/2024. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. The Four Corners D-003 outfall did not discharge during the reporting period.

SURFACE WATER DISCHARGE AND WATER QUALITY

Surface water monitoring is performed in the South Prong Basin of the Alafia River. The following information summarizes the sampling location designations within the Alafia River basin.

South Prong of the Alafia River Basin sampling is conducted at the following four locations:

- South Prong Alafia River @ West Bethlehem Road
- South Prong Alafia River @ Lonesome Mine Road
- South Prong Alafia River @ Thatcher Road
- South Prong Alafia River @ Jameson Road

Tributaries to the South Prong of the Alafia River Basin are sampled at the following seven locations:

- Hall's Branch @ Virgil Hall
- Upper Lake Branch
- Lake Branch @ Lonesome Mine Road
- Hurrah Creek @ Hiscock Rd Bridge
- Hurrah Creek @ 672
- Upper Boggy Branch
- Boggy Branch (Dragline crossing)

As required by the Development of Regional Impact (DRI), surface water samples are collected monthly at all locations. Except as noted below, continuous flow was reported at all sampling locations within the South Prong of the Alafia River and the associated tributaries.

South Prong of Alafia @ West Bethlehem Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality standards. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the South Prong of Alafia (WBID 1653) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

South Prong of Alafia @ Lonesome Mine Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality standards. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the South Prong of Alafia (WBID 1653) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

South Prong of Alafia @ Thatcher Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality standards. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the South Prong of Alafia (WBID 1653) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

South Prong of Alafia @ Jameson Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality standards. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the South Prong of Alafia (WBID 1653) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC

threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Tributaries to the South Prong of the Alafia River Basin

Hall's Branch @ Virgil Hall
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in December 2024 and May 2025.

Lake Branch @ Lonesome Mine Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The dissolved oxygen measured in September and October 2024 was slightly below the standard of >38% saturation. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, Lake Branch (WBID 1697) is not currently listed as impaired for nutrients and the South Prong of Alafia (WBID 1653) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow from November 2024 to May 2025.

Upper Lake Branch
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow from October 2024 to April 2025.

Hurrah Creek @ Hiscock Road Bridge
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. There was no measurable flow for the majority of the reporting year, resulting in insufficient data to calculate the geomean for Chlorophyll-a, Total Phosphorus, or Total Nitrogen. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Hurrah Creek @ County Road 672
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Upper Boggy
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, Upper Boggy (WBID 1695A) is not currently listed as impaired for nutrients and the South Prong of Alafia (WBID 1653) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. There was no measurable flow in September 2024 and from December 2024 to May 2025. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Boggy Branch
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards There was no measurable flow from April to May 2025. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Little Manatee River Basin

Little Manatee River Basin sampling is conducted at the following five locations:

- Little Manatee River @ Dragline Crossing Section 16
- Little Manatee River @ Taylor Gill Road Upstream
- Little Manatee River @ County Road 39
- Little Manatee River @ State Road 674
- Little Manatee River Exit at Grange Hall Loop Road

Tributaries to the Manatee River Basin are sampled at the following six locations:

- Alderman Creek @ Section 33 Crossing
- Alderman Creek @ Taylor Gill Road Downstream
- Howard's Prairie
- Tributary to Howard's Prairie
- Unnamed Tributary to Little Manatee River
- Pierce Branch @ Owens Road

As required by the Development of Regional Impact 263 (DRI), surface water samples are collected monthly at all locations. Except as noted below, continuous flow was reported at all sampling locations within the Little Manatee River and the associated tributaries.

Little Manatee River @ Dragline Crossing Section 16
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The Total Nitrogen was elevated in June 2024; however, the average geometric mean did not exceed the criteria for class III freshwaters. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the Little Manatee River (WBID 1768) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in April 2025.

Little Manatee River @ Taylor Gill Road Upstream
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The Total Nitrogen was elevated in June 2024; however, the average geometric mean did not exceed the criteria for class III freshwaters. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the Little Manatee River (WBID 1768) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in April 2025.

Little Manatee River @ CR 39
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The Total Nitrogen was

elevated in June 2024; however, the average geometric mean did not exceed the criteria for class III freshwaters. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the Little Manatee River (WBID 1768) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Little Manatee River @ SR 674
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow April or May 2025.

Little Manatee River @ Grange Hall Loop Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Tributaries to the Little Manatee River Basin

Alderman Creek @ Section 33 Crossing
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The average geometric mean (AGM) for total phosphorus (TP) was above the Numeric Nutrient Criteria (NNC) threshold of 0.49 mg/L. However, the Little Manatee River (WBID 1768) is considered to be healthy based on a third-party analysis of both the phosphorus AGM and available biological data despite a total phosphorous AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in December 2024 or April and May 2025

Alderman Creek @ Taylor Gill Road Downstream
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

Howard's Prairie Downstream
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The Total Nitrogen was elevated in June 2024; however, the average geometric mean did not exceed the criteria for class III freshwaters. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in April or May 2025.

Tributary to Howard's Prairie Downstream
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in July 2024 or April and May 2025.

Unnamed Tributary to Little Manatee River
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. There was no measurable flow in July, September, October 2024 or April and May 2025, resulting in insufficient data to calculate the geomean for Chlorophyll-a, Total Phosphorus, or Total Nitrogen. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods.

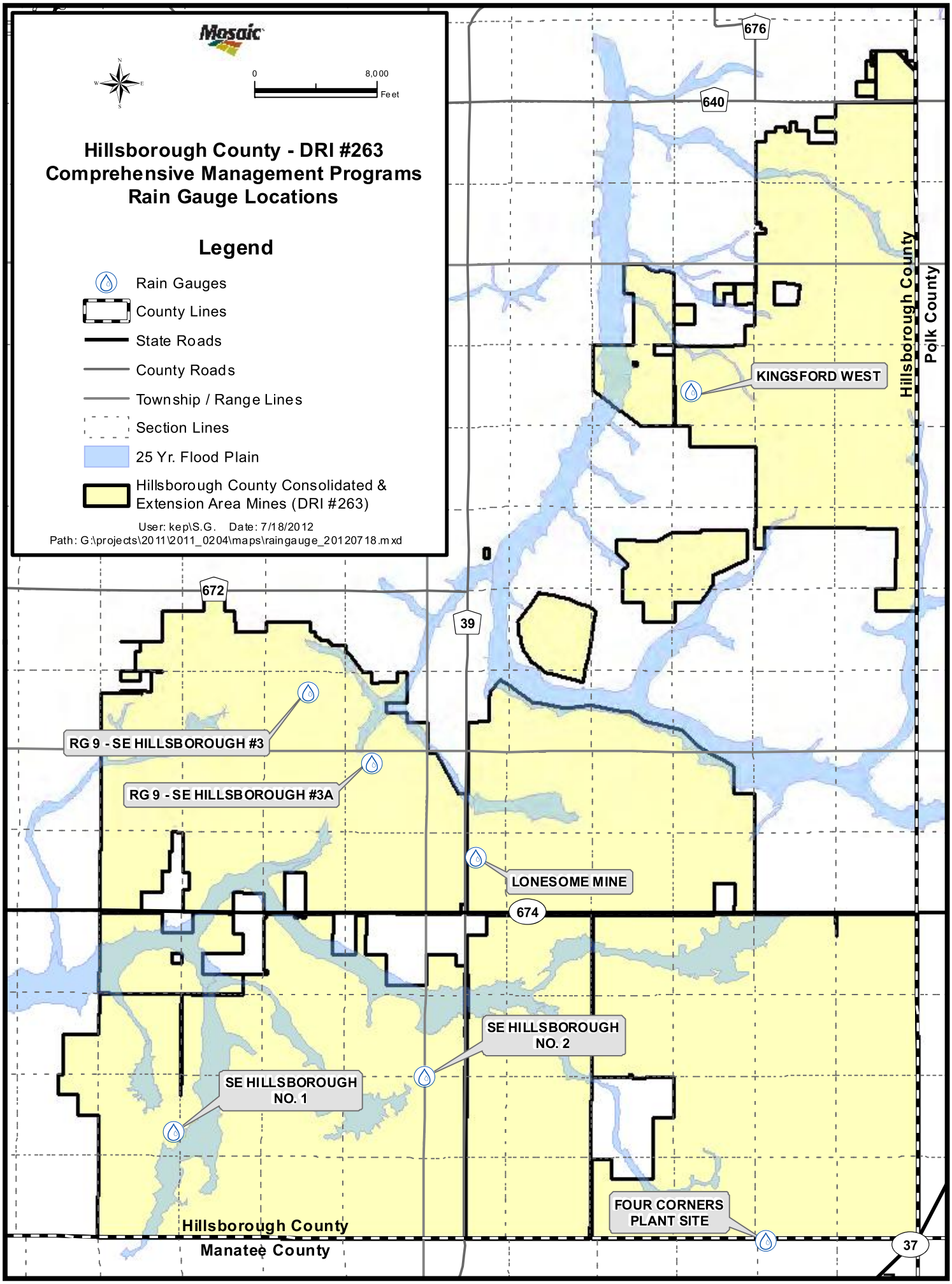
Pierce Branch @ Owens Road
All surface water quality parameters measured at this monitoring location during the reporting year met or were below applicable surface water quality permitted limits and standards. The average geometric mean (AGM) for total nitrogen (TN) was above the Numeric Nutrient Criteria (NNC) threshold of 1.65 mg/L. However, the Little Manatee River (WBID 1768) is considered to be healthy based on a third-party analysis of available biological data despite a total nitrogen AGM above the NNC threshold. Monitoring conducted during this reporting period is consistent with data measured in previous reporting periods. There was no measurable flow in September 2024 or April 2025.

STREAM FLOW DATA

Continuous stream flow data and charts are provided for the following locations:

- USGS Station # 02300100: Little Manatee River near Ft. Lonesome
- USGS Station # 02301300: South Prong Alafia River near Lithia
- PR-4 Tributary to Howard's Prairie
- PR-5 Howard's Prairie
- PR-6 Pierce Branch at Owens Road
- PR-7 Hurrah Creek at SR 672

The PR-4 (Tributary to Howards Prairie) logger malfunctioned from 11/6/24-12/10/24 and the data was unable to be recovered. The PR-7 (Hurrah Creek at SR 672) logger was washed away with the dock during Hurricane Debbie and the data from 7/3/24-8/28/24 was unable to be recovered.


Mosaic
0
8,000
Feet
Hillsborough County - DRI #263
Comprehensive Management Programs
Rain Gauge Locations
Legend
Rain Gauges
County Lines
State Roads
County Roads
Township / Range Lines
Section Lines
25 Yr. Flood Plain
Hillsborough County Consolidated & Extension Area Mines (DRI #263)
User: kep\S.G. Date: 7/18/2012
Path: G:\projects\2011\2011_0204\maps\raingauge_20120718.mxd
676
640
Hillsborough County
Polk County
KINGSFORD WEST
672
39
RG 9 - SE HILLSBOROUGH #3
RG 9 - SE HILLSBOROUGH #3A
LONESOME MINE
674
SE HILLSBOROUGH NO. 2
SE HILLSBOROUGH NO. 1
FOUR CORNERS PLANT SITE
Hillsborough County
Manatee County
37

Mosaic Fertilizer, LLC.
Rainfall Data
SE Hillsborough No. 1 Rain Gauge (Relocated December 2012) MFC-RG71
July 1, 2024 through June 30, 2025

	2024						2025					
Day	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**	**May**	**June**
1	0	0.61	0.01	0.73	0.05	0	0	0	0	0	0	0.09
2	0	0.01	0.66	0.04	0	0	0	0	0	0.02	0.03	0.16
3	0.91	0.54	0.75	0.14	0	0	0	0	0	0	0	0.18
4	0.11	2.96	2.03	0.01	0.01	0.04	0	0	0.01	0	0	0.54
5	1.76	7.94	0.06	0	0.02	0	0	0.06	0.24	0	0	0
6	0	0.31	0.01	0.34	0.04	0	0.16	0	0	0	0	0
7	0	0.19	0	0.09	0	0	0	0	0	0.09	0	0
8	0.07	0	0	0.06	0	0	0.04	0	0	0.22	0	0
9	0	0.13	0.38	4.46	0	0	0	0	0	0	0.48	0
10	0	0.09	0	0.24	0	0	0	0	0.14	0	2.04	0.05
11	0	1.06	0	0	0	0.27	0.01	0	0	0	0.46	1.85
12	1.39	0.09	0	0	0	0	0	0	0	0.17	1.15	2.34
13	0.01	0	0	0	0	0	0.12	0	0	0	0	0.28
14	0.17	0.19	0.3	0	0	0	0	0	0	0	0	1.83
15	0.01	0.1	0	0	0	0	0	0	0	0	0	0.5
16	0.15	0	0	0	0	0	0	0.02	0	0	0	0.5
17	0	0	0	0	0	0	0	0	0	0	0	0.18
18	1.06	0	0.89	0	0	0	0.02	0	0	0	0	0.02
19	0.03	0	0	0	0	0	0	0.33	0	0	0	0.1
20	0.25	0.9	0	0	0.15	0	0	0	0.01	0	0	0.24
21	0.01	0.04	0	0	0	0	0.47	0	0	0	0	0
22	0.91	0.24	0	0	0	0	0.19	0	0	0	0	0
23	0.37	3.31	0	0	0	0	0.15	0	0	0	0	0.82
24	0.29	0.21	0	0	0	0	0	1.55	0	0	0	0.03
25	0	0.01	0.14	0	0	0	0	0	0	0	0.07	0.23
26	0	0.11	2.47	0	0	0	0	0	0	0	0	0
27	0	0	0.27	0	0	0	0	0	0	0	0.44	1.01
28	0.02	0.76	0.11	0	0	0.01	0	0	0	0	0	0.02
29	0.01	0.01	0	0	0.15	0.56	0		0.03	0	0	1.52
30	0.94	0.61	0	0.11	0	0.01	0		0.01	0	0.25	0
31	0	0		0.01		0	0		0		0.83	
Totals:	**8.47**	**20.42**	**8.08**	**6.23**	**0.42**	**0.89**	**1.16**	**1.96**	**0.44**	**0.50**	**5.75**	**12.49**
Year												
2021	8.86	5.15	4.19	1.68	2.29	1.42	0.13	1.9	0.35	2.75	0.29	4.71
2022	9.72	2.69	14.1	0.2	2.71	2.05	1.02	0.94	2.82	0.53	3.02	6.17
2023	2.68	8.6	4.36	1.16	1.35	2.6	0.92	0.54	0.15	5.75	3.64	6.36
2024	8.47	20.42	8.08	6.23	0.42	0.89	2.27	2.24	1.15	1.33	1.77	4.52
2025							1.16	1.96	0.44	0.50	5.75	12.49
3-year average	**6.96**	**10.57**	**8.85**	**2.53**	**1.49**	**1.85**	**1.45**	**1.58**	**0.58**	**2.53**	**3.72**	**7.79**

Total rainfall 2024-2025 reporting period 66.81 inches
Total rainfall 2023-2024 reporting period 34.03 inches
Difference between current and previous reporting period 32.78 inches

Mosaic Fertilizer, LLC.
Rainfall Data
SE Hillsborough No. 2 Rain Gauge
July 1, 2024 through June 30, 2025

	2024						2025					
Day	July	August	September	October	November	December	January	February	March	April	May	June
1	0.55	0.01	0	1.56	0	0	0	0	0	X	0	0.67
2	0	0.03	0	0.28	0	0	0	0	0	X	0	0.04
3	0	0	0.01	0	0	0	0	0	0	X	0.01	0.44
4	1.57	0.51	0	0.03	0	0	0	0	0	X	0.45	0.75
5	0.06	2.32	0.01	0.25	0	0	0	0	0	X	0.01	0.09
6	2.08	7.38	0	0	0.06	0	0	0	0.21	X	0	0.03
7	0	0.22	0	0.28	0	0	0	0	0	X	0	0.02
8	0	0.39	0	0.1	0	0	0	0	0	X	0	0
9	0.12	0	0	0.06	0	0	0	0	0	X	0	0
10	0	0.61	0	5.57	0	0	0	0	0	X	0.2	0
11	0	0.06	0	0.18	0	0.01	0.02	0	0.12	X	0.3	0.04
12	0.01	3.31	0	0	0	0.04	0	0	0	X	0.84	0.59
13	0.63	1.19	0	0	0	0	0	0	0	X	0.96	0.84
14	0.08	0.01	0	0	0	0	0	0	X	X	0	0.23
15	0.45	0	0	0	0	0	0	0	X	X	0	1.85
16	0	0.71	0	0	0	0	0	0	X	0	0	0.81
17	0	0	0	0	0	0	0	0	X	0	0	0
18	0	0	0	0	0	0	0	0	X	0	0	0.22
19	0.46	0	0	0	0	0	0	0	X	0	0	0.3
20	0.5	0	0	0	0.18	0	0	0.28	X	0	0	0.37
21	0.2	1.47	0	0	0	0	0.16	0	X	0	0	1.39
22	0	0.17	0	0	0	0	0.2	0	X	0	0	0
23	0.17	0.25	0	0	0	0	0	0	X	0	0	0
24	0.77	2.74	0	0	0	0	0.01	0	X	0	0	0.09
25	0.33	0.15	0	0	0	0	0	1.8	X	0	0	0.27
26	0	0.01	1.28	0	0	0	0	0	X	0	0	0.06
27	0	0.14	0.05	0	0	0	0	0	X	0	0	0
28	0	0	0	0	0	0	0	0	X	0	0.1	0.51
29	1.24	0.22	0	0	0	0	0		X	0	0	0.26
30	0.05	0	0	0	0	0	0		X	0	0.48	1.55
31	1.56	0.23		0		0	0		X		0	
Totals:	**10.83**	**22.13**	**1.35**	**8.31**	**0.24**	**0.05**	**0.39**	**2.08**	**0.33**	**0.00**	**3.35**	**11.42**
Year												
2021	8.86	7.55	7.34	1.68	2.81	1.31	0.38	3.43	1.86	2.76	1.97	4.74
2022	7.89	5.45	12.76	0.09	3.36	1.81	0.95	0.7	2.18	2.63	4.18	3.22
2023	4.84	4.93	3.79	1.55	1.69	2.05	0.73	7.13	0.48	5.64	2.57	4.43
2024	10.83	22.13	1.35	8.31	0.24	0.05	3.03	1.78	0.36	1.53	1.79	1.56
2025							0.39	2.08	0.33	0	3.35	11.42
3-year average	**7.84**	**13.53**	**2.57**	**4.93**	**0.97**	**1.05**	**1.28**	**2.92**	**0.84**	**2.45**	**2.97**	**5.16**

Total rainfall 2024-2025 reporting period 60.48 inches
Total rainfall 2023-2024 reporting period 28.90 inches
Difference between current and previous reporting period 31.58 inches

Mosaic Fertilizer, LLC.
Rainfall Data
SE Hillsborough No. 3 Rain Gauge
July 1, 2024 through June 30, 2025

	2024						2025					
Day	July	August	September	October	November	December	January	February	March	April	May	June
1	0	0.06	0.09	0.11	0.01	0	0	0	0	0	0	0
2	0.06	0	0.75	0	0	0	0	0	0	0.03	0.03	0.12
3	1.08	0.57	0.02	0	0	0	0	0	0	0	0.04	0.42
4	0.03	1.93	1	0.01	0.06	0.04	0	0	0.02	0	0.06	0.49
5	1.35	7.97	1.34	0	0.01	0	0	0.04	0.1	0	0	0
6	0	0.45	0	0.28	0.01	0	0.02	0	0	0	0	0
7	0	0.16	0.15	0.06	0	0	0	0	0	0.17	0	0
8	0.42	0	0.01	0.03	0	0	0.06	0	0	0.25	0	0
9	0.01	0	1.12	4.59	0.03	0	0	0	0	0.01	0.2	0
10	0	0	0	0.22	0	0	0	0	0.11	0	0.93	0.77
11	0.01	0.22	0	0	0	0.37	0.02	0	0	0.18	0.42	0.96
12	0.68	0.04	0.27	0	0	0	0	0	0	0.25	1.08	0.66
13	0.04	0	0	0	0	0	0.12	0	0	0	0	1.28
14	3.05	0	0.03	0	0	0	0	0	0	0	0	1.91
15	0.25	0.09	0	0	0	0	0	0	0	0	0	0.4
16	0	0	0.04	0	0	0	0	0.01	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	1.24
18	0.36	0	0.15	0	0	0	0	0	0	0	0	0.62
19	1.18	0	0	0	0	0	0.04	0.47	0	0	0	1.58
20	0.1	0.39	0.02	0	0.15	0	0	0	0.02	0	0	0.47
21	0	1.15	0	0	0	0	0.53	0	0	0	0	0
22	0.04	0.21	0	0	0	0	0.17	0	0	0	0	0
23	0.77	0.5	0	0	0	0	0.1	0	0	0	0	0.13
24	0.34	0.96	0	0	0	0	0	1.63	0	0	0	0.01
25	0.18	0.01	0.04	0	0	0	0	0.01	0	0	0	0.02
26	0	0.01	1.65	0	0	0	0	0	0	0	0	0
27	0	0	0.4	0	0	0	0	0	0	0	0	0.74
28	0.05	0	0.12	0	0	0	0	0	0	0	0	0.03
29	0	0	0	0	0.03	0.32	0		0.01	0	0	2.59
30	2	0.07	0	0	0	0	0		0.05	0	0.27	0
31	0	0.01		0		0.01	0		0		1.04	
Totals:	**12.00**	**14.80**	**7.20**	**5.30**	**0.30**	**0.74**	**1.06**	**2.16**	**0.31**	**0.89**	**4.07**	**14.44**
Year												
2021	9.19	7.34	8.57	0.02	3.24	1.5	0.30	2.81	1.84	3.12	1.96	4.99
2022	7.82	4.18	11.69	0.10	2.33	1.40	1.11	0.90	2.25	2.89	4.15	7.96
2023	3.35	7.25	3.84	0.77	1.32	2.45	1.95	0.36	0.38	5.29	4.24	9.65
2024	12.00	14.80	7.20	5.30	0.30	0.74	2.64	2.13	1.18	1.53	1.02	4.10
2025							1.06	2.16	0.31	0.89	4.07	14.44
3-year average	**8.09**	**8.39**	**7.83**	**1.55**	**1.80**	**1.52**	**1.69**	**1.39**	**1.03**	**2.65**	**3.37**	**9.04**

Total rainfall 2024-2025 reporting period **63.27** **inches**
Total rainfall 2023-2024 reporting period **31.58** **inches**
Difference between current and previous reporting period **31.69** **inches**

Mosaic Fertilizer, LLC.
Rainfall Data
Four Corners Rain Gauge
July 1, 2024 through June 30, 2025

	2024						2025					
Day	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**	**May**	**June**
1	0.21	0.17	1.25	0.11	0.03	0	0	0	0	0	0	0.02
2	0.08	0	0.02	0.05	0	0.11	0	0	0	0.04	0.07	0.27
3	0	0.39	0.12	0.18	0	0	0	0.05	0	0	0.28	1.21
4	2.66	2.64	1.67	0.17	0	0	0	0	0.02	0	0	0.3
5	1	4.26	0.18	0	0.06	0	0	0.04	0.01	0	0	0
6	0	0.68	0	0.37	0	0	0.15	0	0	0	0	0
7	0	0.32	0	0.07	0	0	0	0	0	0	0	0
8	0	0	0.17	0.06	0	0	0	0	0	0.06	0	0
9	0	0.3	0.3	4.25	0	0	0	0	0	0	0.43	0
10	0	0	0	0.34	0	0	0	0	0.03	0	0.23	0
11	0.03	0.39	0	0	0	0.03	0.03	0	0	0	0.64	0.44
12	0.03	1.27	0	0	0	0	0	0	0	0.12	1.88	0.99
13	0.03	0	0	0	0	0	0.03	0	0	0	0	0
14	0.79	0.02	0.19	0	0	0	0	0	0	0	0	0.4
15	0	0.1	0	0	0	0	0	0	0	0	0	2.07
16	0	0	0	0	0	0	0	0.02	0	0	0	0.1
17	0	0	0	0	0	0	0	0	0	0	0	0.87
18	0.03	0	0.21	0	0	0	0	0	0	0	0	0.33
19	0.24	0	0.08	0	0	0	0.09	0.4	0	0	0	1.01
20	0	0.84	0	0	0.18	0	0	0	0.01	0	0	1.07
21	0	0.45	0.13	0	0	0	0.55	0	0	0	0	0
22	0.93	0.11	0	0	0	0	0.2	0	0	0	0	0
23	2.45	0.51	0	0	0	0	0.09	0	0	0	0	0.45
24	0.03	0.01	0	0	0	0	0	1.52	0	0	0	0.29
25	0.05	0.07	0.12	0	0	0	0	0	0	0	0	0.02
26	0	0.07	2.28	0	0	0	0	0	0	0	0.28	0
27	0.01	0.01	0.11	0	0	0	0	0	0	0	0	0.21
28	0.01	1.15	0.01	0	0	0	0	0	0	0	0.04	0
29	0.06	0.02	0	0	0.07	0.87	0		0.04	0	0.03	0.45
30	1.05	0.06	0	0.3	0	0	0		0.01	0	0.01	0.01
31	0.12	0		0		0	0		0		0.44	
Totals:	**9.81**	**13.84**	**6.84**	**5.90**	**0.34**	**1.01**	**1.14**	**2.03**	**0.12**	**0.22**	**4.33**	**10.51**
Year												
2021	10.66	8.79	11.16	1.68	2.66	1.17	0.48	0.24	2.41	2.76	0.50	4.74
2022	8.39	10.83	15.53	0.30	2.72	2.24	0.50	0.73	0.42	0.85	2.54	4.10
2023	4.59	9.79	5.57	0.45	1.02	3.05	0.73	0.11	0.82	3.95	2.51	3.58
2024	9.81	12.84	6.84	5.90	0.34	1.01	4.49	0.38	1.05	1.28	1.11	3.35
2025							1.14	2.03	0.12	0.22	4.33	10.51
3-year average	**8.36**	**10.56**	**9.78**	**2.08**	**1.69**	**1.87**	**1.72**	**0.81**	**0.60**	**1.58**	**2.62**	**5.39**

Total rainfall 2024-2025 reporting period	**56.09**	**inches**
Total rainfall 2023-2024 reporting period	**36.13**	**inches**
Difference between current and previous reporting period	**19.96**	**inches**

Mosaic Fertilizer, LLC.
Rainfall Data
Lonesome Rain Gauge
July 1, 2024 through June 30, 2025

	2024						2025					
Day	July	August	September	October	November	December	January	February	March	April	May	June
1	0	0.06	0.01	0.12	0.02	0	0	0	0	0	0	0.05
2	0.03	0	0.43	0.04	0	0	0	0	0	0.02	0.02	0.3
3	1.62	0.58	0.06	0.07	0	0	0	0	0	0	0.02	0.92
4	0	2.27	0.95	0.06	0	0.01	0	0	0.05	0	0.01	0.38
5	2.03	7.67	1.06	0	0	0	0	0.01	0.21	0	0	0
6	0	0.17	0	0.27	0	0	0	0	0	0	0	0
7	0	0.22	0.08	0.01	0.01	0	0	0	0	0.09	0	0
8	0	0	0.03	0.04	0	0	0	0	0	0.26	0	0
9	0	0.05	1.08	4.79	0	0	0	0	0	0	0	0
10	0	0.1	0	0	0	0	0.04	0	0.02	0	0.05	1.72
11	0	1.29	0	0	0	0	0.02	0	0	0.09	1.05	1.33
12	1.3	0	0.11	0	0	0	0	0	0	0.29	1.11	0.68
13	0.11	0	0	0	0	0	0.12	0	0	0	0.01	0.39
14	2.57	0	0.01	0	0	0	0.01	0	0	0	0	0.85
15	0.3	0.13	0	0.03	0	0	0	0	0	0	0	0.87
16	0	0	0	0	0	0	0	0.01	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	1.51
18	0.7	0	0.14	0	0	0	0	0	0	0	0	0.55
19	0.52	0	0	0	0	0	0.03	0.4	0	0	0	2.54
20	0.08	1.1	0	0	0.01	0	0	0	0	0	0	0.76
21	0	0.46	0	0	0	0	0.55	0	0	0	0	0
22	0.12	0.2	0	0	0	0	0.21	0	0	0	0	0.03
23	0.83	0.97	0	0	0	0	0.11	0	0	0	0	0.51
24	0.6	0.41	0	0	0	0	0.01	1.92	0	0	0	0
25	0.14	0.01	0.06	0	0	0	0	0	0	0	0	0.06
26	0	0	2.07	0	0	0	0	0	0	0	0	0
27	0	0	0.23	0	0	0	0	0	0	0	0	1.19
28	0.03	0	0.1	0	0	0	0	0	0	0	0	0.26
29	0.1	0	0	0	0.01	0	0		0	0	0	3.89
30	1.8	0.07	0	0	0	0	0		0	0	0	0.01
31	0	0		0		0	0		0		1.27	
Totals:	**12.88**	**15.76**	**6.42**	**5.43**	**0.05**	**0.01**	**1.10**	**2.34**	**0.28**	**0.75**	**3.54**	**18.80**
Year												
2021	4.42	7.52	7.41	0.01	3.11	0.01	0.39	3.27	2.64	0.61	2.23	6.59
2022	10.37	4.67	16.01	0.14	1.65	1.75	1.00	0.82	2.49	3.50	3.20	10.22
2023	0.00	9.58	3.64	0.86	1.27	2.83	1.95	0.14	0.63	5.97	4.76	7.93
2024	12.88	15.76	6.42	5.43	0.05	0.01	3.34	2.26	2.45	1.45	0.76	4.56
2025							1.10	2.34	0.28	0.75	3.54	18.80
3-year average	**6.92**	**7.26**	**8.37**	**1.61**	**1.52**	**1.15**	**1.85**	**1.39**	**1.46**	**2.92**	**3.07**	**10.38**

Total rainfall 2024-2025 reporting period 67.36 inches
Total rainfall 2023-2024 reporting period 33.00 inches
Difference between current and previous reporting period 34.36 inches

Mosaic Fertilizer, LLC.
Rainfall Data
Kingsford West Rain Gauge MKF-RG13
July 1, 2024 through June 30, 2025

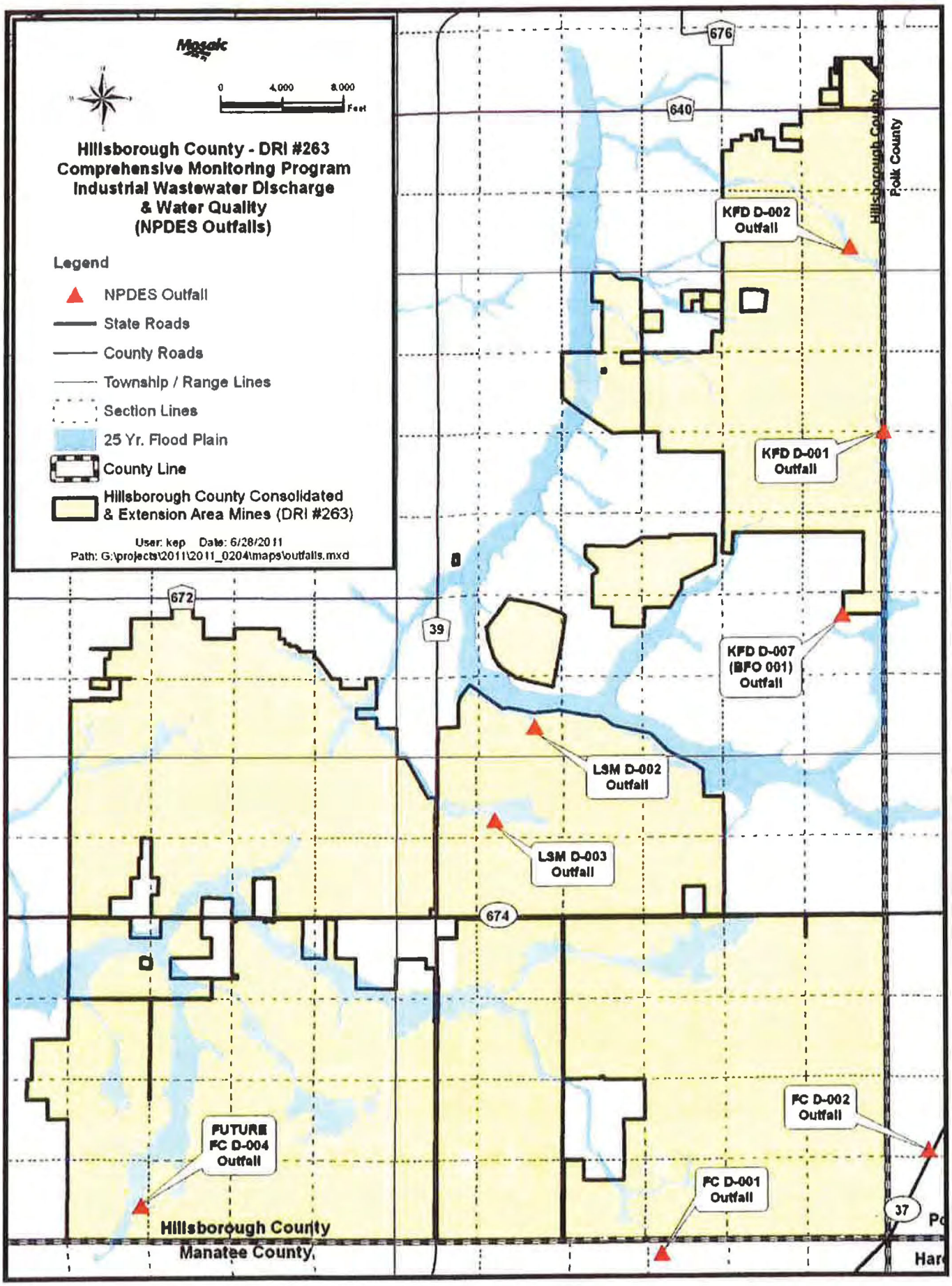
	2024						2025					
Day	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**	**May**	**June**
1	0	0.49	0.74	0	0	0	0	0	0	0	0	0
2	0.11	0.01	1.21	0.04	0	0	0	0	0	0.02	0.04	0.04
3	0	0.18	0.01	0	0	0	0	0	0	0	0	0.16
4	0	1.51	0.09	0.1	0	0.05	0	0	0.05	0	0.03	0.13
5	0.28	5.89	1.75	0	0.07	0	0	0.07	0.11	0	0	0
6	0	0.17	0.13	0.05	0	0	0.02	0	0	0	0	0
7	0	0.07	0.81	0.13	0	0	0	0	0	0.12	0	0
8	0.03	0	0.01	0	0	0	0.04	0	0	0.15	0	0
9	0	0.04	0.27	4.29	0	0	0	0	0	0	0.04	0
10	0	0.29	0	0.2	0	0	0	0	0.01	0	0.33	0.09
11	0.03	0.35	0	0	0	0.02	0.01	0	0	0	0.31	0.28
12	0	0.51	0	0	0	0	0	0	0	0.15	0.72	0.15
13	0.17	0	0	0	0	0	0.07	0	0	0	0	0
14	1	0	0	0	0	0	0	0	0	0	0	0.24
15	0.02	1	0	0	0	0	0	0	0	0	0	0.15
16	0	0	0	0	0	0	0	0	0.01	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	1.36
18	0.19	0	0	0	0	0	0	0	0	0	0	0.15
19	0.89	0	0	0	0	0	0.13	0.45	0	0	0	1.99
20	1.18	0.63	0	0	0	0	0	0	0	0	0	0.36
21	0	0.65	0	0	0	0	0.83	0	0	0	0	0
22	0.05	0.17	0	0	0	0	0.2	0	0	0	0	0
23	0.9	0.31	0	0	0	0	0.07	0	0	0	0	0
24	0.04	0.05	0	0	0	0	0	1.57	0	0	0.02	0
25	0	0.01	0.28	0	0	0	0	0	0	0	0.38	0
26	0	0.11	1.12	0	0	0	0	0	0	0	0.07	0
27	0.09	0	0.28	0	0	0	0	0	0	0	0	0.61
28	0.09	0	0.08	0	0	0	0	0	0	0	0.04	0.12
29	0	0	0	0	0	0.19	0		0	0	0	1.82
30	1.7	0.59	0	0	0	0.01	0		0.01	0	0	0
31	0	0		0		0.01	0		0		2.66	
Totals:	**6.77**	**13.03**	**6.78**	**4.81**	**0.07**	**0.28**	**1.37**	**2.09**	**0.19**	**0.44**	**4.64**	**7.65**
Year												
2021	8.95	3.81	5.51	3.15	2.79	1.05	0.13	1.9	0.35	2.75	0.29	4.71
2022	2.25	4.87	6.55	0.3	3.64	1.01	1.09	0.67	1.03	0.09	0.95	3.02
2023	8.47	20.42	8.08	6.23	0.42	0.89	1.28	0.35	0.04	3.25	6.38	6.03
2024	6.77	13.03	6.78	4.81	0.07	0.28	1.16	1.96	0.44	0.5	5.75	12.49
2025							1.37	2.09	0.19	0.44	4.64	7.65
3-year average	**5.83**	**12.77**	**7.14**	**3.78**	**1.38**	**0.73**	**1.27**	**1.47**	**0.22**	**1.40**	**5.59**	**8.72**

Total rainfall 2024-2025 reporting period **48.12** **inches**
Total rainfall 2023-2024 reporting period **34.98** **inches**
Difference between current and previous reporting period **13.14** **inches**

Mosaic Fertilizer, LLC
Groundwater Quality Data
Four Corners Deep Well
July 1, 2024 through June 30, 2025

Date	Alkalinity mg/l	Calcium; Dissolved mg/l	Chloride mg/l	Fluoride mg/l	Gross Alpha pCi/l	Potassium; Dissolved mg/l	Magnesium; Dissolved mg/l	Sodium; Dissolved mg/l	Nitrate mg/l	pH SU	Specific Conductance umho/cm	Sulfate mg/l	Dissolved Solids; Total mg/l	Total Phosphorus mg/l	Turbidity NTU	Temperature C	Radium 226 & 228; Combined pCi/l
7/17/2024	136	45	17	0.814	2.9	1.14	16.7	10.8	<0.05	7.51	405	45.4	277	<0.05	0.52	26.1	NR
8/14/2024	135	45.8	17.4	0.815	4.1	1.23	17.1	10.8	0.01 I	7.59	399	45.1	239	<0.01	0.85	28.7	NR
9/18/2024	132	47.1	16.9	0.841	4	1.23	17.2	10.8	<0.05	7.24	403	44.7	270	<0.05	0.91	26.4	NR
10/23/2024	134	46.6	17.2	0.761	4.8	1.27	16.3	10.6	<0.05	7.26	405	43.3	251	<0.05	0.51	25.2	NR
11/13/2024	133	56.5	17.4	0.833	<1.9	1.25	18.1	11.2	<0.05	7.27	404	46.4	254	<0.05	0.34	26.1	NR
12/11/2024	132	47.8	17.2	0.85	3.5	1.31	17	10.8	<0.05	7.03	407	45.6	257	<0.05	0.59	25.2	NR
1/15/2025	133	46.2	17.2	0.814	2.2	1.17	16.7	10.3	<0.05	7.66	414	46	235	<0.05	0.87	21.5	NR
2/19/2025	133	44.4	16.9	0.732	3.7	1.22	16.5	10.3	<0.05	7.35	407	43.1	263	<0.05	0.59	24.3	NR
3/19/2025	133	47.8	17.1	0.83	5.1	1.28	16.9	10.9	<0.05	7.13	409	44.5	254	<0.05	0.35	24.3	NR
4/23/2025	131	45.9	17.1	0.849	3.1	1.17	16.3	10.3	<0.05	6.91	399	45.3	221	0.08 I	0.56	24.5	NR
5/21/2025	130	45.3	17	0.802	3.6	1.06	16.9	10.3	<0.05	6.97	400	45.5	267	<0.05	0.48	25.5	NR
6/18/2025	130	45.7	17.1	0.771	2	1.18	16.4	10	0.22	7.65	402	44.9	248	0.13 I	0.44	25.5	NR

MNR = Monitoring Not Required


Mosaic
0 4,000 8,000
Feet
Hillsborough County - DRI #263
Comprehensive Monitoring Program
Industrial Wastewater Discharge
& Water Quality
(NPDES Outfalls)
Legend
NPDES Outfall
State Roads
County Roads
Township / Range Lines
Section Lines
25 Yr. Flood Plain
County Line
Hillsborough County Consolidated
& Extension Area Mines (DRI #263)
User: kep Date: 6/28/2011
Path: G:\projects\2011\2011_0204\maps\outfalls.mxd
676
640
672
39
674
37
Hillsborough County
Polk County
Hillsborough County
Manatee County
KFD D-002
Outfall
KFD D-001
Outfall
KFD D-007
(BFO 001)
Outfall
LSM D-002
Outfall
LSM D-003
Outfall
FUTURE
FC D-004
Outfall
FC D-002
Outfall
FC D-001
Outfall

Mosaic Fertilizer, LLC
Industrial Wastewater
Lonesome Outfall D-002 Water Quality Data
July 1, 2024 to June 30, 2025

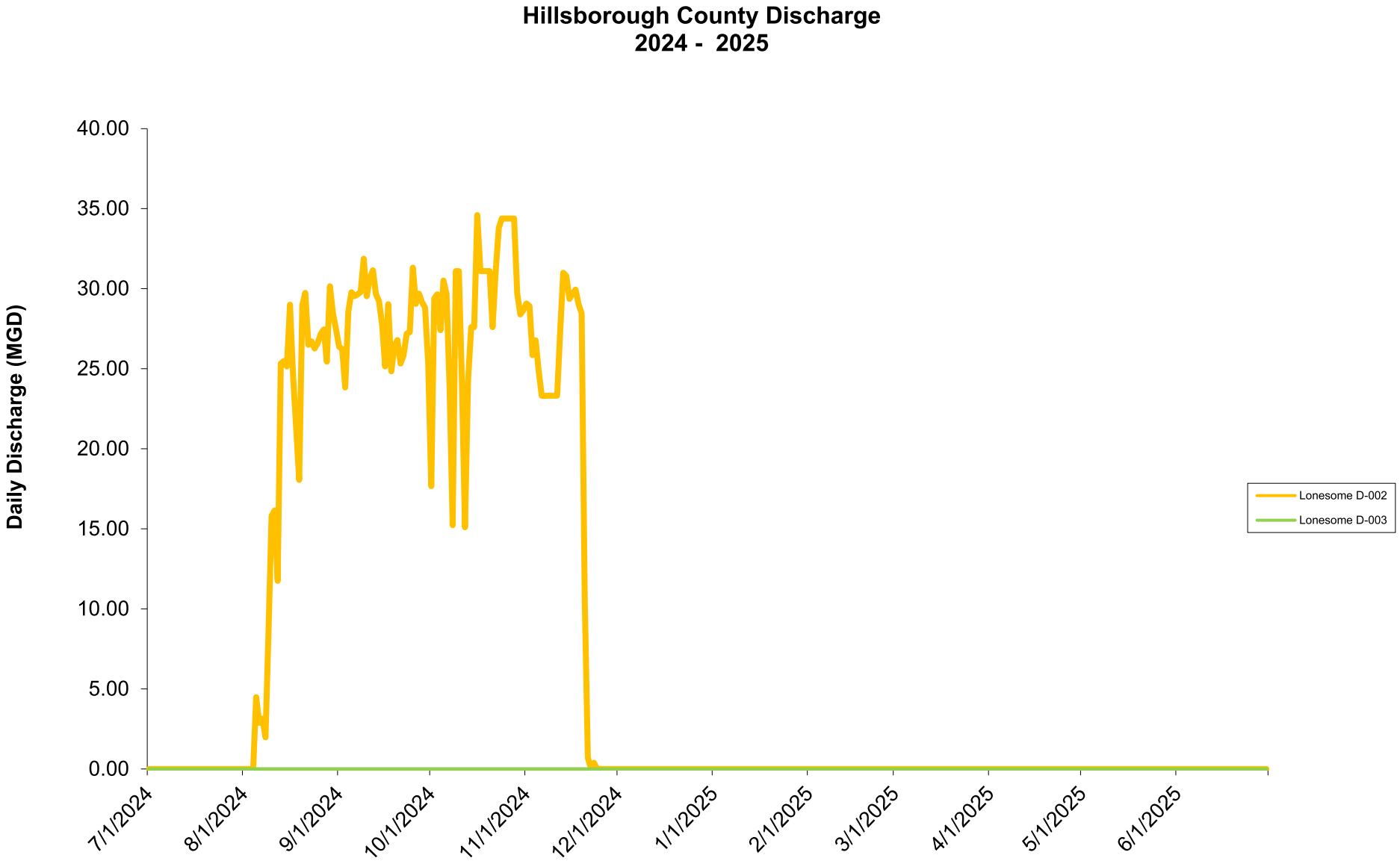
Date	Flow	Dissolved Oxygen	Turbidity	pH	Specific Conductance	Temperature	Total Suspended Solids (TSS)	Total Non-Volatile, Non-Filterable Residue	Total Phosphorus	Total Nitrogen	Nitrate-Nitrite (NOx)	Total Kjeldahl Nitrogen	Sulfate	Chlorophyll-a	Fluoride
NPDES Permitted Limits	Report	>38	<29 above background	6.0-8.5	<1275	Report	60 (daily max)	25 (daily max)	5 (daily max)	3 (daily max)	Report	Report	Report	Report	10 (daily max)
	MGD	% Saturation	NTU	SU	umhos/cm	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L
8/5/2024	6.45	79.20	10.60	6.59	210.20	26.50	6.40	3.20	1.17	1.19	0.11	1.08	50.90	1.12	0.42
8/15/2024	26.60	MNR	8.29	7.03	MNR	MNR	9.60	4.20	0.33	MNR	MNR	MNR	MNR	MNR	MNR
8/19/2024	17.40	MNR	9.03	7.63	MNR	MNR	7.00	4.00	0.23	MNR	MNR	MNR	MNR	MNR	MNR
8/29/2024	29.10	MNR	8.67	7.20	MNR	MNR	7.60	5.20	0.47	MNR	MNR	MNR	MNR	MNR	MNR
9/4/2024	29.00	95.80	15.90	6.98	394.00	29.10	11.20	7.80	0.61	1.96	0.06	1.90	MNR	MNR	MNR
9/10/2024	29.80	MNR	6.74	6.86	MNR	MNR	10.00	8.00	0.23	MNR	MNR	MNR	MNR	MNR	MNR
9/18/2024	19.00	MNR	7.56	6.81	MNR	MNR	14.40	10.00	0.62	MNR	MNR	MNR	MNR	MNR	MNR
9/24/2024	27.90	MNR	8.26	7.78	MNR	MNR	9.00	5.80	0.25	MNR	MNR	MNR	MNR	MNR	MNR
10/2/2024	22.10	87.70	6.34	7.20	397.00	29.50	4.60	2.40	<0.05	0.79	0.07	0.72	67.20	5.96	0.85
10/7/2024	30.40	MNR	7.91	7.68	MNR	MNR	6.00	3.80	<0.05	MNR	MNR	MNR	MNR	MNR	MNR
10/16/2024	33.00	MNR	5.23	6.36	MNR	MNR	7.00	5.00	0.38	MNR	MNR	MNR	MNR	MNR	MNR
10/22/2024	31.20	MNR	11.60	7.92	MNR	MNR	9.20	6.60	0.47	MNR	MNR	MNR	MNR	MNR	MNR
10/30/2024	28.40	MNR	6.01	6.99	MNR	MNR	11.00	9.60	0.28	MNR	MNR	MNR	MNR	MNR	MNR
11/4/2024	19.60	92.10	7.44	7.98	445.00	25.00	5.80	3.40	0.40	1.02	0.26	0.76	MNR	MNR	MNR
11/13/2024	28.70	MNR	6.12	7.21	MNR	MNR	10.40	7.00	0.49	MNR	MNR	MNR	MNR	MNR	MNR
11/18/2024	30.10	MNR	8.00	7.64	MNR	MNR	5.20	3.00	0.34	MNR	MNR	MNR	MNR	MNR	MNR

< - Below Laboratory Method Detection Limit

MNR - Monitoring not required

Mosaic Fertilizer, LLC
Industrial Wastewater
Lonesome Outfall D-003 Water Quality Data
July 1, 2024 to June 30, 2025

Date	Flow	Dissolved Oxygen	Turbidity	pH	Specific Conductance	Temperature	Total Suspended Solids (TSS)	Total Non-Volatile, Non-Filterable Residue	Total Phosphorus	Total Nitrogen	Nitrate-Nitrite (NOx)	Total Kjeldahl Nitrogen	Sulfate	Chlorophyll-a	Fluoride
NPDES Permitted Limits	Report	>38	<29 above background	6.0-8.5	<1275	Report	60 (daily max)	25 (daily max)	5 (daily max)	3 (daily max)	Report	Report	Report	Report	10 (daily max)
	MGD	% Saturation	NTU	SU	umhos/cm	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L
MMLS D-003 did not discharge during the reporting period															


Hillsborough County Discharge
2024 - 2025
Daily Discharge (MGD)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
7/1/2024
8/1/2024
9/1/2024
10/1/2024
11/1/2024
12/1/2024
1/1/2025
2/1/2025
3/1/2025
4/1/2025
5/1/2025
6/1/2025
Lonesome D-002
Lonesome D-003

Lonesome Outfall D-002 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
7/1/2024	0.00	8/1/2024	0.00	9/1/2024	26.38
7/2/2024	0.00	8/2/2024	0.00	9/2/2024	26.23
7/3/2024	0.00	8/3/2024	0.00	9/3/2024	23.83
7/4/2024	0.00	8/4/2024	0.00	9/4/2024	28.57
7/5/2024	0.00	8/5/2024	4.49	9/5/2024	29.78
7/6/2024	0.00	8/6/2024	2.88	9/6/2024	29.53
7/7/2024	0.00	8/7/2024	3.15	9/7/2024	29.64
7/8/2024	0.00	8/8/2024	1.97	9/8/2024	29.79
7/9/2024	0.00	8/9/2024	8.47	9/9/2024	31.87
7/10/2024	0.00	8/10/2024	15.81	9/10/2024	29.53
7/11/2024	0.00	8/11/2024	16.16	9/11/2024	30.63
7/12/2024	0.00	8/12/2024	11.75	9/12/2024	31.15
7/13/2024	0.00	8/13/2024	25.32	9/13/2024	29.66
7/14/2024	0.00	8/14/2024	25.48	9/14/2024	29.21
7/15/2024	0.00	8/15/2024	25.14	9/15/2024	27.74
7/16/2024	0.00	8/16/2024	29.00	9/16/2024	25.14
7/17/2024	0.00	8/17/2024	24.56	9/17/2024	29.03
7/18/2024	0.00	8/18/2024	21.37	9/18/2024	24.83
7/19/2024	0.00	8/19/2024	18.05	9/19/2024	26.42
7/20/2024	0.00	8/20/2024	28.97	9/20/2024	26.79
7/21/2024	0.00	8/21/2024	29.74	9/21/2024	25.32
7/22/2024	0.00	8/22/2024	26.50	9/22/2024	25.83
7/23/2024	0.00	8/23/2024	26.71	9/23/2024	27.19
7/24/2024	0.00	8/24/2024	26.26	9/24/2024	27.28
7/25/2024	0.00	8/25/2024	26.59	9/25/2024	31.31
7/26/2024	0.00	8/26/2024	27.16	9/26/2024	29.06
7/27/2024	0.00	8/27/2024	27.46	9/27/2024	29.68
7/28/2024	0.00	8/28/2024	25.44	9/28/2024	29.15
7/29/2024	0.00	8/29/2024	30.15	9/29/2024	28.82
7/30/2024	0.00	8/30/2024	28.44	9/30/2024	25.38
7/31/2024	0.00	8/31/2024	27.47		
Monthly Flow	0.00		564.48		844.78

Lonesome Outfall D-002 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
10/1/2024	17.66	11/1/2024	29.08	12/1/2024	0.00
10/2/2024	29.39	11/2/2024	28.91	12/2/2024	0.00
10/3/2024	29.65	11/3/2024	25.85	12/3/2024	0.00
10/4/2024	27.41	11/4/2024	26.77	12/4/2024	0.00
10/5/2024	30.51	11/5/2024	24.85	12/5/2024	0.00
10/6/2024	29.65	11/6/2024	23.32	12/6/2024	0.00
10/7/2024	23.63	11/7/2024	23.30	12/7/2024	0.00
10/8/2024	15.22	11/8/2024	23.32	12/8/2024	0.00
10/9/2024	31.10	11/9/2024	23.32	12/9/2024	0.00
10/10/2024	31.10	11/10/2024	23.32	12/10/2024	0.00
10/11/2024	24.30	11/11/2024	23.32	12/11/2024	0.00
10/12/2024	15.10	11/12/2024	27.26	12/12/2024	0.00
10/13/2024	24.30	11/13/2024	30.99	12/13/2024	0.00
10/14/2024	27.60	11/14/2024	30.79	12/14/2024	0.00
10/15/2024	27.60	11/15/2024	29.36	12/15/2024	0.00
10/16/2024	34.60	11/16/2024	29.67	12/16/2024	0.00
10/17/2024	31.10	11/17/2024	29.94	12/17/2024	0.00
10/18/2024	31.10	11/18/2024	29.01	12/18/2024	0.00
10/19/2024	31.10	11/19/2024	28.47	12/19/2024	0.00
10/20/2024	31.10	11/20/2024	10.61	12/20/2024	0.00
10/21/2024	27.60	11/21/2024	0.69	12/21/2024	0.00
10/22/2024	31.10	11/22/2024	0.07	12/22/2024	0.00
10/23/2024	33.79	11/23/2024	0.39	12/23/2024	0.00
10/24/2024	34.38	11/24/2024	0.00	12/24/2024	0.00
10/25/2024	34.38	11/25/2024	0.00	12/25/2024	0.00
10/26/2024	34.38	11/26/2024	0.00	12/26/2024	0.00
10/27/2024	34.38	11/27/2024	0.00	12/27/2024	0.00
10/28/2024	34.38	11/28/2024	0.00	12/28/2024	0.00
10/29/2024	29.71	11/29/2024	0.00	12/29/2024	0.00
10/30/2024	28.39	11/30/2024	0.00	12/30/2024	0.00
10/31/2024	28.65			12/31/2024	0.00
Monthly Flow	894.37		522.58		0.00

Lonesome Outfall D-002 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
1/1/2025	0.00	2/1/2025	0.00	3/1/2024	0.00
1/2/2025	0.00	2/2/2025	0.00	3/2/2024	0.00
1/3/2025	0.00	2/3/2025	0.00	3/3/2024	0.00
1/4/2025	0.00	2/4/2025	0.00	3/4/2024	0.00
1/5/2025	0.00	2/5/2025	0.00	3/5/2024	0.00
1/6/2025	0.00	2/6/2025	0.00	3/6/2024	0.00
1/7/2025	0.00	2/7/2025	0.00	3/7/2024	0.00
1/8/2025	0.00	2/8/2025	0.00	3/8/2024	0.00
1/9/2025	0.00	2/9/2025	0.00	3/9/2024	0.00
1/10/2025	0.00	2/10/2025	0.00	3/10/2024	0.00
1/11/2025	0.00	2/11/2025	0.00	3/11/2024	0.00
1/12/2025	0.00	2/12/2025	0.00	3/12/2024	0.00
1/13/2025	0.00	2/13/2025	0.00	3/13/2024	0.00
1/14/2025	0.00	2/14/2025	0.00	3/14/2024	0.00
1/15/2025	0.00	2/15/2025	0.00	3/15/2024	0.00
1/16/2025	0.00	2/16/2025	0.00	3/16/2024	0.00
1/17/2025	0.00	2/17/2025	0.00	3/17/2024	0.00
1/18/2025	0.00	2/18/2025	0.00	3/18/2024	0.00
1/19/2025	0.00	2/19/2025	0.00	3/19/2024	0.00
1/20/2025	0.00	2/20/2025	0.00	3/20/2024	0.00
1/21/2025	0.00	2/21/2025	0.00	3/21/2024	0.00
1/22/2025	0.00	2/22/2025	0.00	3/22/2024	0.00
1/23/2025	0.00	2/23/2025	0.00	3/23/2024	0.00
1/24/2025	0.00	2/24/2025	0.00	3/24/2024	0.00
1/25/2025	0.00	2/25/2025	0.00	3/25/2024	0.00
1/26/2025	0.00	2/26/2025	0.00	3/26/2024	0.00
1/27/2025	0.00	2/27/2025	0.00	3/27/2024	0.00
1/28/2025	0.00	2/28/2025	0.00	3/28/2024	0.00
1/29/2025	0.00			3/29/2024	0.00
1/30/2025	0.00			3/30/2024	0.00
1/31/2025	0.00			3/31/2024	0.00
Monthly Flow	0.00		0.00		0.00

Lonesome Outfall D-002 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
4/1/2025	0.00	5/1/2025	0.00	6/1/2025	0.00
4/2/2025	0.00	5/2/2025	0.00	6/2/2025	0.00
4/3/2025	0.00	5/3/2025	0.00	6/3/2025	0.00
4/4/2025	0.00	5/4/2025	0.00	6/4/2025	0.00
4/5/2025	0.00	5/5/2025	0.00	6/5/2025	0.00
4/6/2025	0.00	5/6/2025	0.00	6/6/2025	0.00
4/7/2025	0.00	5/7/2025	0.00	6/7/2025	0.00
4/8/2025	0.00	5/8/2025	0.00	6/8/2025	0.00
4/9/2025	0.00	5/9/2025	0.00	6/9/2025	0.00
4/10/2025	0.00	5/10/2025	0.00	6/10/2025	0.00
4/11/2025	0.00	5/11/2025	0.00	6/11/2025	0.00
4/12/2025	0.00	5/12/2025	0.00	6/12/2025	0.00
4/13/2025	0.00	5/13/2025	0.00	6/13/2025	0.00
4/14/2025	0.00	5/14/2025	0.00	6/14/2025	0.00
4/15/2025	0.00	5/15/2025	0.00	6/15/2025	0.00
4/16/2025	0.00	5/16/2025	0.00	6/16/2025	0.00
4/17/2025	0.00	5/17/2025	0.00	6/17/2025	0.00
4/18/2025	0.00	5/18/2025	0.00	6/18/2025	0.00
4/19/2025	0.00	5/19/2025	0.00	6/19/2025	0.00
4/20/2025	0.00	5/20/2025	0.00	6/20/2025	0.00
4/21/2025	0.00	5/21/2025	0.00	6/21/2025	0.00
4/22/2025	0.00	5/22/2025	0.00	6/22/2025	0.00
4/23/2025	0.00	5/23/2025	0.00	6/23/2025	0.00
4/24/2025	0.00	5/24/2025	0.00	6/24/2025	0.00
4/25/2025	0.00	5/25/2025	0.00	6/25/2025	0.00
4/26/2025	0.00	5/26/2025	0.00	6/26/2025	0.00
4/27/2025	0.00	5/27/2025	0.00	6/27/2025	0.00
4/28/2025	0.00	5/28/2025	0.00	6/28/2025	0.00
4/29/2025	0.00	5/29/2025	0.00	6/29/2025	0.00
4/30/2025	0.00	5/30/2025	0.00	6/30/2025	0.00
		5/31/2025	0.00		
Monthly Flow	0.00		0.00		0.00

	July 1, 2024- June 30, 2025	
Number of Days	**365**	**Days**
Minimum	**0.00**	**MGD**
Median	**0.00**	**MGD**
Mean	**7.74**	**MGD**
Maximum	**34.60**	**MGD**
Days of Zero Flow	**254**	**Days**

Lonesome Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
7/1/2024	0.00	8/1/2024	0.00	9/1/2024	0.00
7/2/2024	0.00	8/2/2024	0.00	9/2/2024	0.00
7/3/2024	0.00	8/3/2024	0.00	9/3/2024	0.00
7/4/2024	0.00	8/4/2024	0.00	9/4/2024	0.00
7/5/2024	0.00	8/5/2024	0.00	9/5/2024	0.00
7/6/2024	0.00	8/6/2024	0.00	9/6/2024	0.00
7/7/2024	0.00	8/7/2024	0.00	9/7/2024	0.00
7/8/2024	0.00	8/8/2024	0.00	9/8/2024	0.00
7/9/2024	0.00	8/9/2024	0.00	9/9/2024	0.00
7/10/2024	0.00	8/10/2024	0.00	9/10/2024	0.00
7/11/2024	0.00	8/11/2024	0.00	9/11/2024	0.00
7/12/2024	0.00	8/12/2024	0.00	9/12/2024	0.00
7/13/2024	0.00	8/13/2024	0.00	9/13/2024	0.00
7/14/2024	0.00	8/14/2024	0.00	9/14/2024	0.00
7/15/2024	0.00	8/15/2024	0.00	9/15/2024	0.00
7/16/2024	0.00	8/16/2024	0.00	9/16/2024	0.00
7/17/2024	0.00	8/17/2024	0.00	9/17/2024	0.00
7/18/2024	0.00	8/18/2024	0.00	9/18/2024	0.00
7/19/2024	0.00	8/19/2024	0.00	9/19/2024	0.00
7/20/2024	0.00	8/20/2024	0.00	9/20/2024	0.00
7/21/2024	0.00	8/21/2024	0.00	9/21/2024	0.00
7/22/2024	0.00	8/22/2024	0.00	9/22/2024	0.00
7/23/2024	0.00	8/23/2024	0.00	9/23/2024	0.00
7/24/2024	0.00	8/24/2024	0.00	9/24/2024	0.00
7/25/2024	0.00	8/25/2024	0.00	9/25/2024	0.00
7/26/2024	0.00	8/26/2024	0.00	9/26/2024	0.00
7/27/2024	0.00	8/27/2024	0.00	9/27/2024	0.00
7/28/2024	0.00	8/28/2024	0.00	9/28/2024	0.00
7/29/2024	0.00	8/29/2024	0.00	9/29/2024	0.00
7/30/2024	0.00	8/30/2024	0.00	9/30/2024	0.00
7/31/2024	0.00	8/31/2024	0.00		
Monthly Flow	0.00		0.00		0.00

Lonesome Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
10/1/2024	0.00	11/1/2024	0.00	12/1/2024	0.00
10/2/2024	0.00	11/2/2024	0.00	12/2/2024	0.00
10/3/2024	0.00	11/3/2024	0.00	12/3/2024	0.00
10/4/2024	0.00	11/4/2024	0.00	12/4/2024	0.00
10/5/2024	0.00	11/5/2024	0.00	12/5/2024	0.00
10/6/2024	0.00	11/6/2024	0.00	12/6/2024	0.00
10/7/2024	0.00	11/7/2024	0.00	12/7/2024	0.00
10/8/2024	0.00	11/8/2024	0.00	12/8/2024	0.00
10/9/2024	0.00	11/9/2024	0.00	12/9/2024	0.00
10/10/2024	0.00	11/10/2024	0.00	12/10/2024	0.00
10/11/2024	0.00	11/11/2024	0.00	12/11/2024	0.00
10/12/2024	0.00	11/12/2024	0.00	12/12/2024	0.00
10/13/2024	0.00	11/13/2024	0.00	12/13/2024	0.00
10/14/2024	0.00	11/14/2024	0.00	12/14/2024	0.00
10/15/2024	0.00	11/15/2024	0.00	12/15/2024	0.00
10/16/2024	0.00	11/16/2024	0.00	12/16/2024	0.00
10/17/2024	0.00	11/17/2024	0.00	12/17/2024	0.00
10/18/2024	0.00	11/18/2024	0.00	12/18/2024	0.00
10/19/2024	0.00	11/19/2024	0.00	12/19/2024	0.00
10/20/2024	0.00	11/20/2024	0.00	12/20/2024	0.00
10/21/2024	0.00	11/21/2024	0.00	12/21/2024	0.00
10/22/2024	0.00	11/22/2024	0.00	12/22/2024	0.00
10/23/2024	0.00	11/23/2024	0.00	12/23/2024	0.00
10/24/2024	0.00	11/24/2024	0.00	12/24/2024	0.00
10/25/2024	0.00	11/25/2024	0.00	12/25/2024	0.00
10/26/2024	0.00	11/26/2024	0.00	12/26/2024	0.00
10/27/2024	0.00	11/27/2024	0.00	12/27/2024	0.00
10/28/2024	0.00	11/28/2024	0.00	12/28/2024	0.00
10/29/2024	0.00	11/29/2024	0.00	12/29/2024	0.00
10/30/2024	0.00	11/30/2024	0.00	12/30/2024	0.00
10/31/2024	0.00			12/31/2024	0.00
Monthly Flow	0.00		0.00		0.00

Lonesome Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
1/1/2025	0.00	2/1/2025	0.00	3/1/2025	0.00
1/2/2025	0.00	2/2/2025	0.00	3/2/2025	0.00
1/3/2025	0.00	2/3/2025	0.00	3/3/2025	0.00
1/4/2025	0.00	2/4/2025	0.00	3/4/2025	0.00
1/5/2025	0.00	2/5/2025	0.00	3/5/2025	0.00
1/6/2025	0.00	2/6/2025	0.00	3/6/2025	0.00
1/7/2025	0.00	2/7/2025	0.00	3/7/2025	0.00
1/8/2025	0.00	2/8/2025	0.00	3/8/2025	0.00
1/9/2025	0.00	2/9/2025	0.00	3/9/2025	0.00
1/10/2025	0.00	2/10/2025	0.00	3/10/2025	0.00
1/11/2025	0.00	2/11/2025	0.00	3/11/2025	0.00
1/12/2025	0.00	2/12/2025	0.00	3/12/2025	0.00
1/13/2025	0.00	2/13/2025	0.00	3/13/2025	0.00
1/14/2025	0.00	2/14/2025	0.00	3/14/2025	0.00
1/15/2025	0.00	2/15/2025	0.00	3/15/2025	0.00
1/16/2025	0.00	2/16/2025	0.00	3/16/2025	0.00
1/17/2025	0.00	2/17/2025	0.00	3/17/2025	0.00
1/18/2025	0.00	2/18/2025	0.00	3/18/2025	0.00
1/19/2025	0.00	2/19/2025	0.00	3/19/2025	0.00
1/20/2025	0.00	2/20/2025	0.00	3/20/2025	0.00
1/21/2025	0.00	2/21/2025	0.00	3/21/2025	0.00
1/22/2025	0.00	2/22/2025	0.00	3/22/2025	0.00
1/23/2025	0.00	2/23/2025	0.00	3/23/2025	0.00
1/24/2025	0.00	2/24/2025	0.00	3/24/2025	0.00
1/25/2025	0.00	2/25/2025	0.00	3/25/2025	0.00
1/26/2025	0.00	2/26/2025	0.00	3/26/2025	0.00
1/27/2025	0.00	2/27/2025	0.00	3/27/2025	0.00
1/28/2025	0.00	2/28/2025	0.00	3/28/2025	0.00
1/29/2025	0.00			3/29/2025	0.00
1/30/2025	0.00			3/30/2025	0.00
1/31/2025	0.00			3/31/2025	0.00
Monthly Flow	0.00		0.00		0.00

Lonesome Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
4/1/2025	0.00	5/1/2025	0.00	6/1/2025	0.00
4/2/2025	0.00	5/2/2025	0.00	6/2/2025	0.00
4/3/2025	0.00	5/3/2025	0.00	6/3/2025	0.00
4/4/2025	0.00	5/4/2025	0.00	6/4/2025	0.00
4/5/2025	0.00	5/5/2025	0.00	6/5/2025	0.00
4/6/2025	0.00	5/6/2025	0.00	6/6/2025	0.00
4/7/2025	0.00	5/7/2025	0.00	6/7/2025	0.00
4/8/2025	0.00	5/8/2025	0.00	6/8/2025	0.00
4/9/2025	0.00	5/9/2025	0.00	6/9/2025	0.00
4/10/2025	0.00	5/10/2025	0.00	6/10/2025	0.00
4/11/2025	0.00	5/11/2025	0.00	6/11/2025	0.00
4/12/2025	0.00	5/12/2025	0.00	6/12/2025	0.00
4/13/2025	0.00	5/13/2025	0.00	6/13/2025	0.00
4/14/2025	0.00	5/14/2025	0.00	6/14/2025	0.00
4/15/2025	0.00	5/15/2025	0.00	6/15/2025	0.00
4/16/2025	0.00	5/16/2025	0.00	6/16/2025	0.00
4/17/2025	0.00	5/17/2025	0.00	6/17/2025	0.00
4/18/2025	0.00	5/18/2025	0.00	6/18/2025	0.00
4/19/2025	0.00	5/19/2025	0.00	6/19/2025	0.00
4/20/2025	0.00	5/20/2025	0.00	6/20/2025	0.00
4/21/2025	0.00	5/21/2025	0.00	6/21/2025	0.00
4/22/2025	0.00	5/22/2025	0.00	6/22/2025	0.00
4/23/2025	0.00	5/23/2025	0.00	6/23/2025	0.00
4/24/2025	0.00	5/24/2025	0.00	6/24/2025	0.00
4/25/2025	0.00	5/25/2025	0.00	6/25/2025	0.00
4/26/2025	0.00	5/26/2025	0.00	6/26/2025	0.00
4/27/2025	0.00	5/27/2025	0.00	6/27/2025	0.00
4/28/2025	0.00	5/28/2025	0.00	6/28/2025	0.00
4/29/2025	0.00	5/29/2025	0.00	6/29/2025	0.00
4/30/2025	0.00	5/30/2025	0.00	6/30/2025	0.00
		5/31/2025	0.00		
Monthly Flow	0.00		0.00		0.00

	July 1, 2024- June 30, 2025	
Number of Days	**365**	**Days**
Minimum	**0.00**	**MGD**
Median	**0.00**	**MGD**
Mean	**0.00**	**MGD**
Maximum	**0.00**	**MGD**
Days of Zero Flow	**365**	**Days**

Mosaic Fertilizer, LLC.
Industrial Wastewater
Four Corners Outfall D-001 Water Quality Data
July 1, 2024 to June 30, 2025

Date	Flow	Alkalinity	Calcium; Total	Chlorophyll-a	Chloride	Color	Oxygen; Dissolved	Fluoride
NPDES Permitted Limits	Report	Report	Report	Report	Report	Report	>38	10 (daily max)
	MGD	mg/L	mg/L	ug/L	mg/L	PCU	% Saturation	mg/L
8/7/24	68.3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
8/15/24	86.2	MNR	MNR	MNR	MNR	MNR	MNR	MNR
8/20/24	75.8	MNR	MNR	MNR	MNR	MNR	MNR	MNR
8/29/24	91.5	101	34.1	15.6	7.29	70	42.9	1.05
9/3/24	90.4	MNR	MNR	MNR	MNR	MNR	MNR	MNR
9/9/24	69.7	119	34.6	4.94	6.84	50	39.2	0.919
9/16/24	49.1	MNR	MNR	MNR	MNR	MNR	MNR	MNR
9/23/24	54	MNR	MNR	MNR	MNR	MNR	MNR	MNR
10/1/24	80.4	124	42.6	9.63	8.37	60	63.8	1.28
10/8/24	7.1	MNR	MNR	MNR	MNR	MNR	MNR	MNR
10/17/24	91.3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
10/23/24	91.3	MNR	MNR	MNR	MNR	MNR	MNR	MNR

< - Below Laboratory Method Detection Limit
MNR - Monitoring not required

Mosaic Fertilizer, LLC.
Industrial Wastewater
Four Corners Outfall D-001 Water Quality Data
July 1, 2024 to June 30, 2025

Date	Iron; Total	Potassium; Total	Magnesium; Total	Total Ammonia Nitrogen as N	Nitrate-Nitrite (NOx)	Non-Volatile;Non-Filterable residue (Fixed Solids)	Sodium; Total	Ortho-Phosphate (as P)	Gross Alpha	Radium 226
NPDES Permitted Limits	**Report**	**Report**	**Report**	**Report**	**Report**	**25 (daily max)**	**Report**	**Report**	**15**	**5**
	mg/L	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**pCi/L**	**pCi/L**
8/7/24	MNR	MNR	MNR	MNR	MNR	4.4	MNR	MNR	MNR	MNR
8/15/24	MNR	MNR	MNR	MNR	MNR	11.6	MNR	MNR	MNR	MNR
8/20/24	MNR	MNR	MNR	MNR	MNR	5.4	MNR	MNR	MNR	MNR
8/29/24	0.174	2.11	15.6	0.32	0.06	10.8	20.5	0.113	MNR	0.7
9/3/24	MNR	MNR	MNR	MNR	MNR	9.2	MNR	MNR	MNR	MNR
9/9/24	0.109	1.9	16.7	0.175	0.056	2.6	18.2	0.151	5.2	1.1
9/16/24	MNR	MNR	MNR	MNR	MNR	7	MNR	MNR	MNR	MNR
9/23/24	MNR	MNR	MNR	MNR	MNR	7.2	MNR	MNR	MNR	MNR
10/1/24	0.16	2.26	21.4	0.147	0.04	12.4	23.7	0.105	12.3	1.4
10/8/24	MNR	MNR	MNR	MNR	MNR	2.8	MNR	MNR	MNR	MNR
10/17/24	MNR	MNR	MNR	MNR	MNR	6.8	MNR	MNR	MNR	MNR
10/23/24	MNR	MNR	MNR	MNR	MNR	8	MNR	MNR	MNR	MNR

< - Below Laboratory Method Detection Limit
MNR - Monitoring not required

Mosaic Fertilizer, LLC.
Industrial Wastewater
Four Corners Outfall D-001 Water Quality Data
July 1, 2023 to June 30, 2024

Date	Radium 228	Specific Conductance	Sulfate	Dissolved Solids; Total	Nitrogen Kjeldahl; Total	TOC	Suspended Solids;Total (TSS)
NPDES Permitted Limits	**Report**	**<1276**	**Report**	**Report**	**Report**	**Report**	**60 (daily max)**
	pCi/L	**umhos/cm**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
8/7/24	MNR	MNR	MNR	MNR	MNR	MNR	6
8/15/24	MNR	MNR	MNR	MNR	MNR	MNR	15.4
8/20/24	MNR	MNR	MNR	MNR	MNR	MNR	7.6
8/29/24	0.8	376	64.70	243	1.24	15.4	14.4
9/3/24	MNR	MNR	MNR	MNR	MNR	MNR	13.2
9/9/24	0.7	373	51.20	229	1.46	18	5
9/16/24	MNR	MNR	MNR	MNR	MNR	MNR	9.6
9/23/24	MNR	MNR	MNR	MNR	MNR	MNR	10.6
10/1/24	0.7	450	86.80	272	0.374	18.3	15.2
10/8/24	MNR	MNR	MNR	MNR	MNR	MNR	3.8
10/17/24	MNR	MNR	MNR	MNR	MNR	MNR	10.2
10/23/24	MNR	MNR	MNR	MNR	MNR	MNR	11.5

< - Below Laboratory Method Detection Limit
MNR - Monitoring not required

Mosaic Fertilizer, LLC.
Industrial Wastewater
Four Corners Outfall D-001 Water Quality Data
July 1, 2023 to June 30, 2024

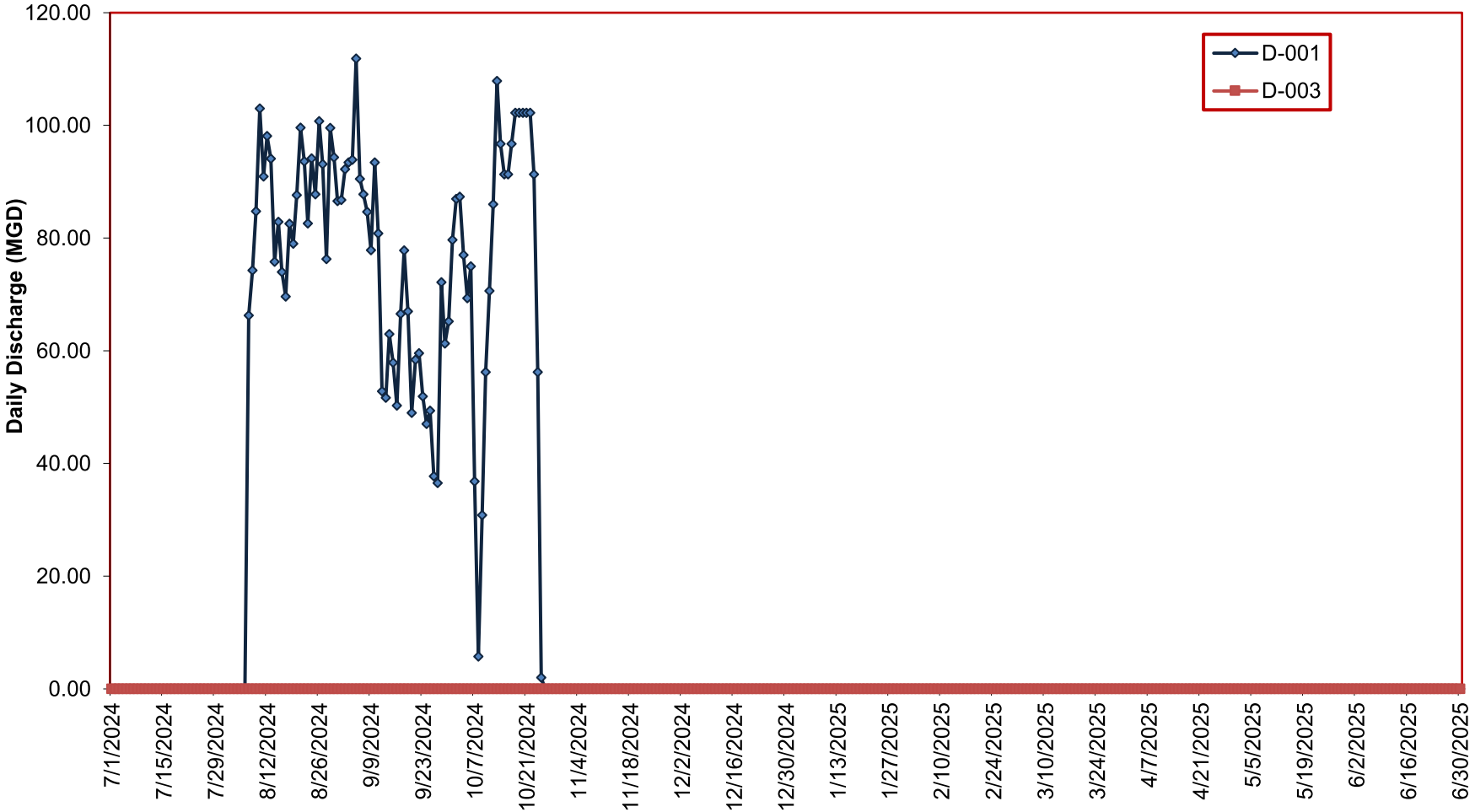
Date	Total Nitrogen	Total Phosphorous	Turbidity	Temperature	pH
NPDES Permitted Limits	Report	5 (daily max)	<29 above background	Report	6.0-8.5
	mg/L	mg/L	NTU	°C	SU
8/7/24	MNR	0.219	10.7	28.3	7.52
8/15/24	MNR	0.565	19.4	30.5	7.16
8/20/24	MNR	0.311	8.62	30.2	7.22
8/29/24	1.3	0.606	16.2	29	7.71
9/3/24	MNR	0.496	13.2	29.9	7.33
9/9/24	1.52	0.376	6.74	29.7	7.47
9/16/24	MNR	0.304	7.41	28.1	7.71
9/23/24	MNR	0.333	9.93	29.7	7.5
10/1/24	0.374	0.05	13.8	28.9	7.05
10/8/24	MNR	0.108	4.8	24.9	7.34
10/17/24	MNR	0.125	10.4	22	7.48
10/23/24	MNR	0.434	11.1	24.2	7.15

< - Below Laboratory Method Detection Limit
MNR - Monitoring not required

Mosaic Fertilizer, LLC.
Industrial Wastewater
Four Corners Outfall D-003 Water Quality Data
July 1, 2024 to June 30, 2025

Date	Flow	Chlorophyll-a	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	Non-Volatile;Non-Filterable residue (Fixed Solids)	Gross Alpha	Radium 226+228	Specific Conductance	Sulfate	Nitrogen Kjeldahl; Total	Suspended Solids;Total (TSS)	Total Nitrogen	Total Phosphorous	Turbidity	Temperature	pH
NPDES Pewrmitted Limits	Report	Report	>38	<10 (daily max)	Report	25.0 (daily max)	15	5	<1275	Report	Report	60.0 (daily max)	3 (daily max)	5 (daily max)	<29 above background	Report	6.0-8.5
	MGD	ug/L	% Saturation	mg/L	mg/L	mg/L	pCi/L	pCi/L	umhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	°C	SU
Four Corners D-003 did not flow during the reporting period.																	

Four Corners Outfall D-001 and Outfall D-003
RY 2024-2025



Four Corners Outfall D-001 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
7/1/2024	0.00	8/1/2024	0.00	9/1/2024	86.73
7/2/2024	0.00	8/2/2024	0.00	9/2/2024	92.20
7/3/2024	0.00	8/3/2024	0.00	9/3/2024	93.40
7/4/2024	0.00	8/4/2024	0.00	9/4/2024	93.87
7/5/2024	0.00	8/5/2024	0.00	9/5/2024	111.83
7/6/2024	0.00	8/6/2024	0.00	9/6/2024	90.46
7/7/2024	0.00	8/7/2024	66.23	9/7/2024	87.75
7/8/2024	0.00	8/8/2024	74.25	9/8/2024	84.64
7/9/2024	0.00	8/9/2024	84.75	9/9/2024	77.84
7/10/2024	0.00	8/10/2024	102.97	9/10/2024	93.40
7/11/2024	0.00	8/11/2024	90.92	9/11/2024	80.80
7/12/2024	0.00	8/12/2024	98.10	9/12/2024	52.77
7/13/2024	0.00	8/13/2024	94.09	9/13/2024	51.64
7/14/2024	0.00	8/14/2024	75.77	9/14/2024	62.94
7/15/2024	0.00	8/15/2024	82.85	9/15/2024	57.86
7/16/2024	0.00	8/16/2024	73.96	9/16/2024	50.26
7/17/2024	0.00	8/17/2024	69.60	9/17/2024	66.52
7/18/2024	0.00	8/18/2024	82.51	9/18/2024	77.79
7/19/2024	0.00	8/19/2024	79.01	9/19/2024	66.95
7/20/2024	0.00	8/20/2024	87.59	9/20/2024	48.94
7/21/2024	0.00	8/21/2024	99.57	9/21/2024	58.39
7/22/2024	0.00	8/22/2024	93.62	9/22/2024	59.53
7/23/2024	0.00	8/23/2024	82.59	9/23/2024	51.90
7/24/2024	0.00	8/24/2024	94.10	9/24/2024	47.02
7/25/2024	0.00	8/25/2024	87.77	9/25/2024	49.36
7/26/2024	0.00	8/26/2024	100.70	9/26/2024	37.72
7/27/2024	0.00	8/27/2024	93.12	9/27/2024	36.54
7/28/2024	0.00	8/28/2024	76.27	9/28/2024	72.14
7/29/2024	0.00	8/29/2024	99.55	9/29/2024	61.26
7/30/2024	0.00	8/30/2024	94.33	9/30/2024	65.20
7/31/2024	0.00	8/31/2024	86.53		
Monthly Flow	0.00		2170.77		2067.67

Four Corners Outfall D-001 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
10/1/2024	79.66	11/1/2024	0.00	12/1/2024	0.00
10/2/2024	86.91	11/2/2024	0.00	12/2/2024	0.00
10/3/2024	87.34	11/3/2024	0.00	12/3/2024	0.00
10/4/2024	76.98	11/4/2024	0.00	12/4/2024	0.00
10/5/2024	69.34	11/5/2024	0.00	12/5/2024	0.00
10/6/2024	74.99	11/6/2024	0.00	12/6/2024	0.00
10/7/2024	36.81	11/7/2024	0.00	12/7/2024	0.00
10/8/2024	5.73	11/8/2024	0.00	12/8/2024	0.00
10/9/2024	30.80	11/9/2024	0.00	12/9/2024	0.00
10/10/2024	56.21	11/10/2024	0.00	12/10/2024	0.00
10/11/2024	70.59	11/11/2024	0.00	12/11/2024	0.00
10/12/2024	85.96	11/12/2024	0.00	12/12/2024	0.00
10/13/2024	107.84	11/13/2024	0.00	12/13/2024	0.00
10/14/2024	96.71	11/14/2024	0.00	12/14/2024	0.00
10/15/2024	91.28	11/15/2024	0.00	12/15/2024	0.00
10/16/2024	91.28	11/16/2024	0.00	12/16/2024	0.00
10/17/2024	96.71	11/17/2024	0.00	12/17/2024	0.00
10/18/2024	102.22	11/18/2024	0.00	12/18/2024	0.00
10/19/2024	102.22	11/19/2024	0.00	12/19/2024	0.00
10/20/2024	102.22	11/20/2024	0.00	12/20/2024	0.00
10/21/2024	102.22	11/21/2024	0.00	12/21/2024	0.00
10/22/2024	102.22	11/22/2024	0.00	12/22/2024	0.00
10/23/2024	91.28	11/23/2024	0.00	12/23/2024	0.00
10/24/2024	56.21	11/24/2024	0.00	12/24/2024	0.00
10/25/2024	2.00	11/25/2024	0.00	12/25/2024	0.00
10/26/2024	0.00	11/26/2024	0.00	12/26/2024	0.00
10/27/2024	0.00	11/27/2024	0.00	12/27/2024	0.00
10/28/2024	0.00	11/28/2024	0.00	12/28/2024	0.00
10/29/2024	0.00	11/29/2024	0.00	12/29/2024	0.00
10/30/2024	0.00	11/30/2024	0.00	12/30/2024	0.00
10/31/2024	0.00		0.00	12/31/2024	0.00
Monthly Flow	1905.73		0.00		0.00

Four Corners Outfall D-001 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
1/1/2025	0.00	2/1/2025	0.00	3/1/2025	0.00
1/2/2025	0.00	2/2/2025	0.00	3/2/2025	0.00
1/3/2025	0.00	2/3/2025	0.00	3/3/2025	0.00
1/4/2025	0.00	2/4/2025	0.00	3/4/2025	0.00
1/5/2025	0.00	2/5/2025	0.00	3/5/2025	0.00
1/6/2025	0.00	2/6/2025	0.00	3/6/2025	0.00
1/7/2025	0.00	2/7/2025	0.00	3/7/2025	0.00
1/8/2025	0.00	2/8/2025	0.00	3/8/2025	0.00
1/9/2025	0.00	2/9/2025	0.00	3/9/2025	0.00
1/10/2025	0.00	2/10/2025	0.00	3/10/2025	0.00
1/11/2025	0.00	2/11/2025	0.00	3/11/2025	0.00
1/12/2025	0.00	2/12/2025	0.00	3/12/2025	0.00
1/13/2025	0.00	2/13/2025	0.00	3/13/2025	0.00
1/14/2025	0.00	2/14/2025	0.00	3/14/2025	0.00
1/15/2025	0.00	2/15/2025	0.00	3/15/2025	0.00
1/16/2025	0.00	2/16/2025	0.00	3/16/2025	0.00
1/17/2025	0.00	2/17/2025	0.00	3/17/2025	0.00
1/18/2025	0.00	2/18/2025	0.00	3/18/2025	0.00
1/19/2025	0.00	2/19/2025	0.00	3/19/2025	0.00
1/20/2025	0.00	2/20/2025	0.00	3/20/2025	0.00
1/21/2025	0.00	2/21/2025	0.00	3/21/2025	0.00
1/22/2025	0.00	2/22/2025	0.00	3/22/2025	0.00
1/23/2025	0.00	2/23/2025	0.00	3/23/2025	0.00
1/24/2025	0.00	2/24/2025	0.00	3/24/2025	0.00
1/25/2025	0.00	2/25/2025	0.00	3/25/2025	0.00
1/26/2025	0.00	2/26/2025	0.00	3/26/2025	0.00
1/27/2025	0.00	2/27/2025	0.00	3/27/2025	0.00
1/28/2025	0.00	2/28/2025	0.00	3/28/2025	0.00
1/29/2025	0.00			3/29/2025	0.00
1/30/2025	0.00			3/30/2025	0.00
1/31/2025	0.00			3/31/2025	0.00
Monthly Flow	0.00		0.00		0.00

Four Corners Outfall D-001 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
4/1/2025	0.00	5/1/2025	0.00	6/1/2025	0.00
4/2/2025	0.00	5/2/2025	0.00	6/2/2025	0.00
4/3/2025	0.00	5/3/2025	0.00	6/3/2025	0.00
4/4/2025	0.00	5/4/2025	0.00	6/4/2025	0.00
4/5/2025	0.00	5/5/2025	0.00	6/5/2025	0.00
4/6/2025	0.00	5/6/2025	0.00	6/6/2025	0.00
4/7/2025	0.00	5/7/2025	0.00	6/7/2025	0.00
4/8/2025	0.00	5/8/2025	0.00	6/8/2025	0.00
4/9/2025	0.00	5/9/2025	0.00	6/9/2025	0.00
4/10/2025	0.00	5/10/2025	0.00	6/10/2025	0.00
4/11/2025	0.00	5/11/2025	0.00	6/11/2025	0.00
4/12/2025	0.00	5/12/2025	0.00	6/12/2025	0.00
4/13/2025	0.00	5/13/2025	0.00	6/13/2025	0.00
4/14/2025	0.00	5/14/2025	0.00	6/14/2025	0.00
4/15/2025	0.00	5/15/2025	0.00	6/15/2025	0.00
4/16/2025	0.00	5/16/2025	0.00	6/16/2025	0.00
4/17/2025	0.00	5/17/2025	0.00	6/17/2025	0.00
4/18/2025	0.00	5/18/2025	0.00	6/18/2025	0.00
4/19/2025	0.00	5/19/2025	0.00	6/19/2025	0.00
4/20/2025	0.00	5/20/2025	0.00	6/20/2025	0.00
4/21/2025	0.00	5/21/2025	0.00	6/21/2025	0.00
4/22/2025	0.00	5/22/2025	0.00	6/22/2025	0.00
4/23/2025	0.00	5/23/2025	0.00	6/23/2025	0.00
4/24/2025	0.00	5/24/2025	0.00	6/24/2025	0.00
4/25/2025	0.00	5/25/2025	0.00	6/25/2025	0.00
4/26/2025	0.00	5/26/2025	0.00	6/26/2025	0.00
4/27/2025	0.00	5/27/2025	0.00	6/27/2025	0.00
4/28/2025	0.00	5/28/2025	0.00	6/28/2025	0.00
4/29/2025	0.00	5/29/2025	0.00	6/29/2025	0.00
4/30/2025	0.00	5/30/2025	0.00	6/30/2025	0.00
		5/31/2025	0.00		
Monthly Flow	0.00		0.00		0.00

	July 1, 2024- June 30, 2025	
Number of Days	**365**	**Days**
Minimum	**0.00**	**MGD**
Median	**0.00**	**MGD**
Mean	**16.86**	**MGD**
Maximum	**111.83**	**MGD**
Days of Zero Flow	**283**	**Days**

Four Corners Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
7/1/2024	0.00	8/1/2024	0.00	9/1/2024	0.00
7/2/2024	0.00	8/2/2024	0.00	9/2/2024	0.00
7/3/2024	0.00	8/3/2024	0.00	9/3/2024	0.00
7/4/2024	0.00	8/4/2024	0.00	9/4/2024	0.00
7/5/2024	0.00	8/5/2024	0.00	9/5/2024	0.00
7/6/2024	0.00	8/6/2024	0.00	9/6/2024	0.00
7/7/2024	0.00	8/7/2024	0.00	9/7/2024	0.00
7/8/2024	0.00	8/8/2024	0.00	9/8/2024	0.00
7/9/2024	0.00	8/9/2024	0.00	9/9/2024	0.00
7/10/2024	0.00	8/10/2024	0.00	9/10/2024	0.00
7/11/2024	0.00	8/11/2024	0.00	9/11/2024	0.00
7/12/2024	0.00	8/12/2024	0.00	9/12/2024	0.00
7/13/2024	0.00	8/13/2024	0.00	9/13/2024	0.00
7/14/2024	0.00	8/14/2024	0.00	9/14/2024	0.00
7/15/2024	0.00	8/15/2024	0.00	9/15/2024	0.00
7/16/2024	0.00	8/16/2024	0.00	9/16/2024	0.00
7/17/2024	0.00	8/17/2024	0.00	9/17/2024	0.00
7/18/2024	0.00	8/18/2024	0.00	9/18/2024	0.00
7/19/2024	0.00	8/19/2024	0.00	9/19/2024	0.00
7/20/2024	0.00	8/20/2024	0.00	9/20/2024	0.00
7/21/2024	0.00	8/21/2024	0.00	9/21/2024	0.00
7/22/2024	0.00	8/22/2024	0.00	9/22/2024	0.00
7/23/2024	0.00	8/23/2024	0.00	9/23/2024	0.00
7/24/2024	0.00	8/24/2024	0.00	9/24/2024	0.00
7/25/2024	0.00	8/25/2024	0.00	9/25/2024	0.00
7/26/2024	0.00	8/26/2024	0.00	9/26/2024	0.00
7/27/2024	0.00	8/27/2024	0.00	9/27/2024	0.00
7/28/2024	0.00	8/28/2024	0.00	9/28/2024	0.00
7/29/2024	0.00	8/29/2024	0.00	9/29/2024	0.00
7/30/2024	0.00	8/30/2024	0.00	9/30/2024	0.00
7/31/2024	0.00	8/31/2024	0.00		
Monthly Flow	0.00		0.00		0.00

Four Corners Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
10/1/2024	0.00	11/1/2024	0.00	12/1/2024	0.00
10/2/2024	0.00	11/2/2024	0.00	12/2/2024	0.00
10/3/2024	0.00	11/3/2024	0.00	12/3/2024	0.00
10/4/2024	0.00	11/4/2024	0.00	12/4/2024	0.00
10/5/2024	0.00	11/5/2024	0.00	12/5/2024	0.00
10/6/2024	0.00	11/6/2024	0.00	12/6/2024	0.00
10/7/2024	0.00	11/7/2024	0.00	12/7/2024	0.00
10/8/2024	0.00	11/8/2024	0.00	12/8/2024	0.00
10/9/2024	0.00	11/9/2024	0.00	12/9/2024	0.00
10/10/2024	0.00	11/10/2024	0.00	12/10/2024	0.00
10/11/2024	0.00	11/11/2024	0.00	12/11/2024	0.00
10/12/2024	0.00	11/12/2024	0.00	12/12/2024	0.00
10/13/2024	0.00	11/13/2024	0.00	12/13/2024	0.00
10/14/2024	0.00	11/14/2024	0.00	12/14/2024	0.00
10/15/2024	0.00	11/15/2024	0.00	12/15/2024	0.00
10/16/2024	0.00	11/16/2024	0.00	12/16/2024	0.00
10/17/2024	0.00	11/17/2024	0.00	12/17/2024	0.00
10/18/2024	0.00	11/18/2024	0.00	12/18/2024	0.00
10/19/2024	0.00	11/19/2024	0.00	12/19/2024	0.00
10/20/2024	0.00	11/20/2024	0.00	12/20/2024	0.00
10/21/2024	0.00	11/21/2024	0.00	12/21/2024	0.00
10/22/2024	0.00	11/22/2024	0.00	12/22/2024	0.00
10/23/2024	0.00	11/23/2024	0.00	12/23/2024	0.00
10/24/2024	0.00	11/24/2024	0.00	12/24/2024	0.00
10/25/2024	0.00	11/25/2024	0.00	12/25/2024	0.00
10/26/2024	0.00	11/26/2024	0.00	12/26/2024	0.00
10/27/2024	0.00	11/27/2024	0.00	12/27/2024	0.00
10/28/2024	0.00	11/28/2024	0.00	12/28/2024	0.00
10/29/2024	0.00	11/29/2024	0.00	12/29/2024	0.00
10/30/2024	0.00	11/30/2024	0.00	12/30/2024	0.00
10/31/2024	0.00			12/31/2024	0.00
Monthly Flow	0.00		0.00		0.00

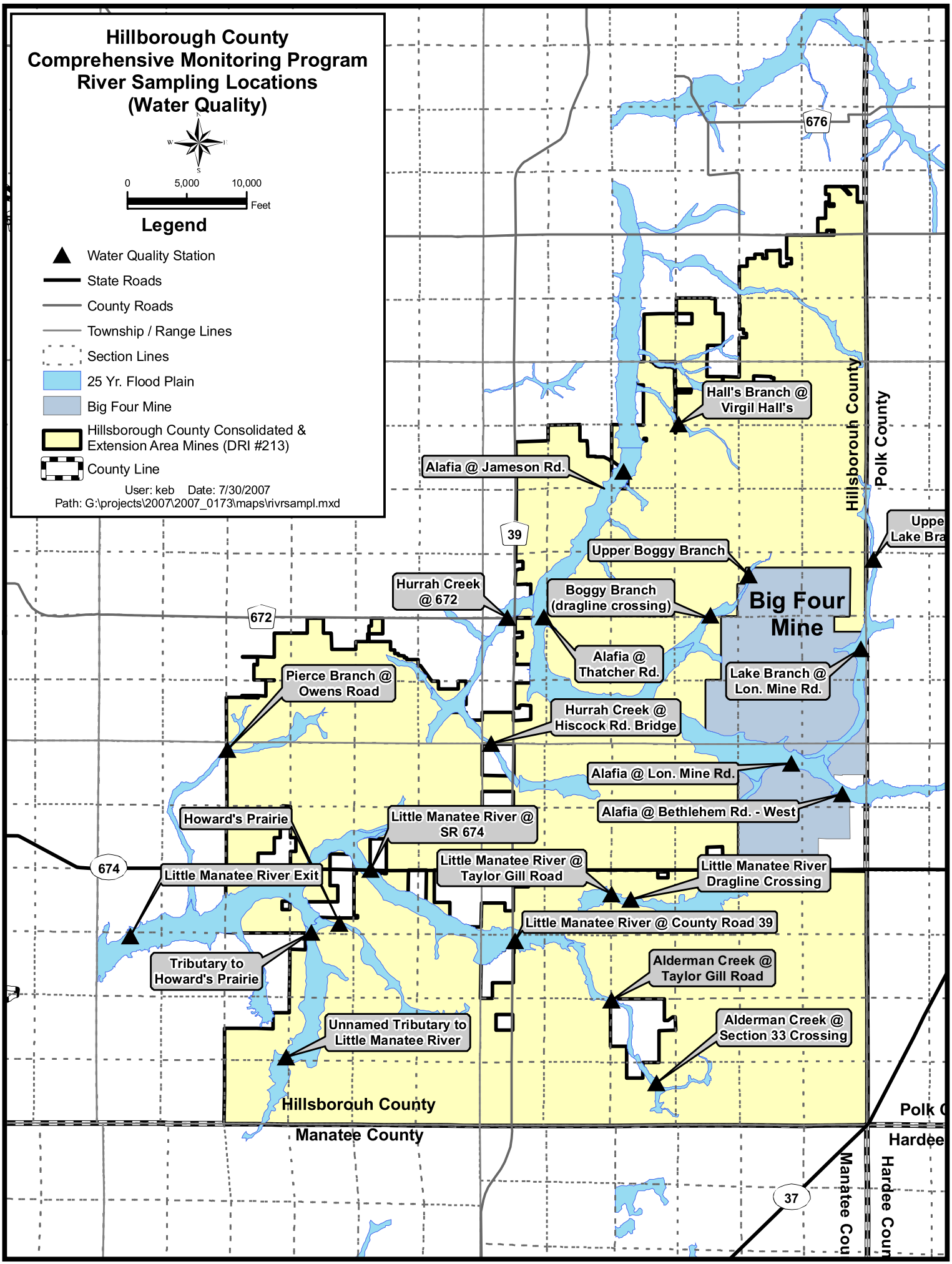
Four Corners Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
1/1/2025	0.00	2/1/2025	0.00	3/1/2025	0.00
1/2/2025	0.00	2/2/2025	0.00	3/2/2025	0.00
1/3/2025	0.00	2/3/2025	0.00	3/3/2025	0.00
1/4/2025	0.00	2/4/2025	0.00	3/4/2025	0.00
1/5/2025	0.00	2/5/2025	0.00	3/5/2025	0.00
1/6/2025	0.00	2/6/2025	0.00	3/6/2025	0.00
1/7/2025	0.00	2/7/2025	0.00	3/7/2025	0.00
1/8/2025	0.00	2/8/2025	0.00	3/8/2025	0.00
1/9/2025	0.00	2/9/2025	0.00	3/9/2025	0.00
1/10/2025	0.00	2/10/2025	0.00	3/10/2025	0.00
1/11/2025	0.00	2/11/2025	0.00	3/11/2025	0.00
1/12/2025	0.00	2/12/2025	0.00	3/12/2025	0.00
1/13/2025	0.00	2/13/2025	0.00	3/13/2025	0.00
1/14/2025	0.00	2/14/2025	0.00	3/14/2025	0.00
1/15/2025	0.00	2/15/2025	0.00	3/15/2025	0.00
1/16/2025	0.00	2/16/2025	0.00	3/16/2025	0.00
1/17/2025	0.00	2/17/2025	0.00	3/17/2025	0.00
1/18/2025	0.00	2/18/2025	0.00	3/18/2025	0.00
1/19/2025	0.00	2/19/2025	0.00	3/19/2025	0.00
1/20/2025	0.00	2/20/2025	0.00	3/20/2025	0.00
1/21/2025	0.00	2/21/2025	0.00	3/21/2025	0.00
1/22/2025	0.00	2/22/2025	0.00	3/22/2025	0.00
1/23/2025	0.00	2/23/2025	0.00	3/23/2025	0.00
1/24/2025	0.00	2/24/2025	0.00	3/24/2025	0.00
1/25/2025	0.00	2/25/2025	0.00	3/25/2025	0.00
1/26/2025	0.00	2/26/2025	0.00	3/26/2025	0.00
1/27/2025	0.00	2/27/2025	0.00	3/27/2025	0.00
1/28/2025	0.00	2/28/2025	0.00	3/28/2025	0.00
1/29/2025	0.00			3/29/2025	0.00
1/30/2025	0.00			3/30/2025	0.00
1/31/2025	0.00			3/31/2025	0.00
Monthly Flow	0.00		0.00		0.00

Four Corners Outfall D-003 Flow July 1, 2024 - June 30, 2025

Date	MGD	Date	MGD	Date	MGD
4/1/2025	0.00	5/1/2025	0.00	6/1/2025	0.00
4/2/2025	0.00	5/2/2025	0.00	6/2/2025	0.00
4/3/2025	0.00	5/3/2025	0.00	6/3/2025	0.00
4/4/2025	0.00	5/4/2025	0.00	6/4/2025	0.00
4/5/2025	0.00	5/5/2025	0.00	6/5/2025	0.00
4/6/2025	0.00	5/6/2025	0.00	6/6/2025	0.00
4/7/2025	0.00	5/7/2025	0.00	6/7/2025	0.00
4/8/2025	0.00	5/8/2025	0.00	6/8/2025	0.00
4/9/2025	0.00	5/9/2025	0.00	6/9/2025	0.00
4/10/2025	0.00	5/10/2025	0.00	6/10/2025	0.00
4/11/2025	0.00	5/11/2025	0.00	6/11/2025	0.00
4/12/2025	0.00	5/12/2025	0.00	6/12/2025	0.00
4/13/2025	0.00	5/13/2025	0.00	6/13/2025	0.00
4/14/2025	0.00	5/14/2025	0.00	6/14/2025	0.00
4/15/2025	0.00	5/15/2025	0.00	6/15/2025	0.00
4/16/2025	0.00	5/16/2025	0.00	6/16/2025	0.00
4/17/2025	0.00	5/17/2025	0.00	6/17/2025	0.00
4/18/2025	0.00	5/18/2025	0.00	6/18/2025	0.00
4/19/2025	0.00	5/19/2025	0.00	6/19/2025	0.00
4/20/2025	0.00	5/20/2025	0.00	6/20/2025	0.00
4/21/2025	0.00	5/21/2025	0.00	6/21/2025	0.00
4/22/2025	0.00	5/22/2025	0.00	6/22/2025	0.00
4/23/2025	0.00	5/23/2025	0.00	6/23/2025	0.00
4/24/2025	0.00	5/24/2025	0.00	6/24/2025	0.00
4/25/2025	0.00	5/25/2025	0.00	6/25/2025	0.00
4/26/2025	0.00	5/26/2025	0.00	6/26/2025	0.00
4/27/2025	0.00	5/27/2025	0.00	6/27/2025	0.00
4/28/2025	0.00	5/28/2025	0.00	6/28/2025	0.00
4/29/2025	0.00	5/29/2025	0.00	6/29/2025	0.00
4/30/2025	0.00	5/30/2025	0.00	6/30/2025	0.00
		5/31/2025	0.00		
Monthly Flow	0.00		0.00		0.00

	July 1, 2024- June 30, 2025	
Number of Days	**0**	**Days**
Minimum	**0.00**	**MGD**
Median	**0.00**	**MGD**
Mean	**0.00**	**MGD**
Maximum	**0.00**	**MGD**
Days of Zero Flow	**0**	**Days**


Hillborough County
Comprehensive Monitoring Program
River Sampling Locations
(Water Quality)
0
5,000
10,000
Feet
Legend
Water Quality Station
State Roads
County Roads
Township / Range Lines
Section Lines
25 Yr. Flood Plain
Big Four Mine
Hillsborough County Consolidated & Extension Area Mines (DRI #213)
County Line
User: keb Date: 7/30/2007
Path: G:\projects\2007\2007_0173\maps\rivrsampl.mxd
676
Hall's Branch @ Virgil Hall's
Alafia @ Jameson Rd.
Hillsborough County
Polk County
39
Upper Boggy Branch
Hurrah Creek @ 672
Boggy Branch (dragline crossing)
Big Four Mine
672
Alafia @ Thatcher Rd.
Lake Branch @ Lon. Mine Rd.
Pierce Branch @ Owens Road
Hurrah Creek @ Hiscock Rd. Bridge
Alafia @ Lon. Mine Rd.
Alafia @ Bethlehem Rd. - West
Howard's Prairie
Little Manatee River @ SR 674
674
Little Manatee River Exit
Little Manatee River @ Taylor Gill Road
Little Manatee River Dragline Crossing
Little Manatee River @ County Road 39
Tributary to Howard's Prairie
Alderman Creek @ Taylor Gill Road
Unnamed Tributary to Little Manatee River
Alderman Creek @ Section 33 Crossing
Hillsborough County
Manatee County
Hardee
37

Mosaic Fertilizer, LLC
Surface Water Quality Data
South Prong of Alafia @ West Bethlehem Road Bridge
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/17/2024	25.8	0.093	0.69	100	83.1	2.72	0.259	7.92	0.989	1.12	1.8	4.6	981	299	1.36	1.62	4.2	27
8/27/2024	32.3	0.19	1.65	150	75.4	1.34	0.264	7.88	0.99	1.28	1.0	1.4	506	93.7	1.75	2.01	2.21	27.9
9/19/2024	42.0	0.06	52.40	125	54.1	1.21	0.296	7.92	0.828	0.91	<1	1.6	447	73	0.562	0.858	3.26	27.5
10/30/2024	24.2	<0.05	5.80	125	68.8	1.46	0.347	7.87	0.97	0.94	1.0	3.6	488	91.4	0.794	1.14	3.95	25.5
11/13/2024	16.2	0.069	5.47	125	69.3	1.64	0.339	7.87	0.967	0.93	1.2	4.2	584	129	0.585	0.924	4.92	26
12/17/2024	9.7	0.134	3.26	125	87.9	1.96	0.317	7.83	0.677	0.95	<1	1.2	761	212	0.442	0.759	3.72	21.5
1/15/2025	6.5	0.085	0.30	70	91.1	1.24	0.462	7.6	0.884	1.03	<1	2.4	635	147	0.788	1.25	4.02	12.4
2/19/2025	5.8	0.11	24.00	50	92.3	2.22	0.31	7.69	0.866	1.11	2.2	4.6	870	244	0.802	1.11	6.08	23.2
3/18/2025	5.5	<0.05	1.01	50	79.1	2.01	0.16	8.02	0.951	1.06	1.2	3.4	870	223	0.727	0.887	4.36	15.1
4/15/2025	2.6	<0.05	0.27	60	87.2	2.18	0.282	8.32	0.968	1.17	2.4	2.6	845	216	0.528	0.81	2.76	21.4
5/22/2025	3.2	0.067	0.37	60	83.2	2.19	0.478	8.08	0.676	0.85	<1	2.8	874	258	0.609	1.09	3.9	27
6/18/2025	12.9	0.054	1.28	200	77.7	1.22	0.153	7.75	0.528	0.804	1.4	3.6	600	182	1.31	1.47	7.4	28.2

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
South Prong of Alafia @ Lonesome Mine Rd.
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/17/2024	59.4	0.091	6.29	175	92.1	1.81	0.158	7.66	0.858	0.969	1.4	3.8	662	168	1.14	1.3	4.45	26.3
8/27/2024	93.7	0.108	1.28	150	66.1	1.42	0.237	7.53	0.971	1.23	<1	2.0	455	74.2	1.59	0.92	2.26	27.5
9/19/2024	112.0	0.074	1.44	125	50.5	1.22	0.293	7.68	0.829	0.846	<1	1.6	448	70.9	0.506	0.799	1.94	27.1
10/30/2024	97.6	0.096	3.64	125	52.3	1.42	0.251	7.85	0.954	0.899	1.2	2.8	474	80.7	1.05	1.3	2.8	23.7
11/14/2024	71,7	<0.05	5.99	100	66.4	1.58	0.305	7.93	0.927	0.946	<1	<1	580	120	0.484	0.789	4.49	22
12/19/2024	34.4	0.107	2.34	100	83.6	1.92	0.303	8.39	0.658	0.772	2.8	4.4	722	191	0.422	0.725	3.9	21.7
1/15/2025	11.8	0.069	0.96	70	88.9	1.10	0.45	7.95	0.714	0.859	<1	1.8	551	113	0.609	1.06	4.18	12
2/19/2025	14.0	0.071	3.84	50	83.4	2.06	0.303	7.95	0.794	0.985	1.6	4.0	851	219	0.612	0.915	6.15	20.1
3/18/2025	14.0	0.052	1.96	40	81.6	2.02	0.184	8.08	0.942	1.07	1.2	3.2	774	225	0.716	0.9	4.67	15.3
4/24/2025	0.5	<0.05	<0.25	50	78.1	1.41	0.088	8.18	1.08	1.36	1.6	3.2	605	129	0.571	0.659	3.57	22.6
5/22/2025	5.5	0.096	0.61	60	78.1	2.41	0.481	8.26	0.704	0.944	1.0	1.2	913	260	0.59	1.07	3.47	27.2
6/18/2025	17.8	0.062	1.35	200	70.0	0.66	0.193	8.32	0.618	0.826	6.8	12.2	362	89.6	0.977	1.17	13.8	26.6

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* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Mosaic Fertilizer, LLC
Surface Water Quality Data
South Prong of Alafia @ Thatcher Rd.
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/18/2024	3.0	0.116	1.29	350	45.8	1.00	<0.04	6.92	0.71	0.877	<1	3.6	360	87.4	1.73	1.73	3.66	27.1
8/28/2024	126.0	0.056	3.55	225	46.6	1.25	0.02	7.52	0.849	0.945	<1	1.0	380	53.5	1.62	1.64	2.94	28.2
9/25/2024	102.0	0.081	1.34	150	57.6	1.12	0.072	7.47	0.916	0.812	1.0	3.0	398	57.7	0.515	0.587	2.14	27.2
10/29/2024	126.0	0.087	1.53	125	52.4	1.18	<0.04	7.19	0.685	0.768	<1	1.8	405	65.5	0.8	0.8	3.34	21.6
11/13/2024	87.2	<0.05	2.23	200	57.0	1.18	<0.04	7.34	0.746	0.692	<1	<1	468	79.9	0.441	0.441	4.08	24.5
12/17/2024	29.8	0.086	2.38	125	57.5	1.62	0.124	7.41	0.657	0.773	2.2	2.6	635	153	0.206	0.33	3.65	19.9
1/29/2025	19.4	0.115	1.12	125	78.2	1.25	0.143	7.51	0.611	0.721	1.2	2.8	645	177	1.16	1.3	4.27	16.3
2/27/2025	35.6	<0.05	1.42	200	57.8	0.98	0.079	7.08	0.592	0.52	4.8	1.2	669	221	0.945	1.02	4.49	18.9
3/26/2025	9.7	0.075	5.40	100	78.0	1.80	0.14	7.93	0.852	0.997	3.7	6.3	833	201	0.785	0.925	4.71	21.1
4/15/2025	7.8	<0.05	21.60	85	91.0	1.87	<0.04	8.19	0.703	0.996	6.4	12.4	783	187	0.781	0.781	7.91	22
5/21/2025	9.7	0.071	11.00	125	90.7	2.26	<0.04	8.00	0.55	0.835	3.6	7.0	965	286	0.593	0.593	5.5	26.5

* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.
OOB = Out Of Banks
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# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
South Prong of Alafia @ Jameson Rd
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/18/2024	93.7	0.248	0.57	350	52.4	0.94	<0.04	7.01	0.73	0.861	1.8	4.4	348	85.2	1.43	1.43	4.81	29.9
8/28/2024	276.0	0.096	0.49	225	41.9	1.17	0.03	7.24	0.906	0.994	<1	2.0	350	46.2	1.18	1.21	3.12	27.4
9/25/2024	145.0	0.092	1.35	225	51.6	1.10	0.078	7.53	0.914	0.793	1.6	2.6	412	56.6	0.629	0.707	2.3	27.4
10/29/2024	178.0	0.076	0.52	125	60.2	1.12	<0.04	7.54	0.734	0.786	<1	2.2	394	60.4	0.674	0.674	1.89	22.3
11/13/2024	130.0	0.05	0.52	150	51.3	1.17	0.06	7.62	0.81	0.761	<1	1.6	454	75.8	0.534	0.594	2.52	24
12/17/2024	32.2	0.087	0.59	125	73.2	1.44	0.209	6.76	0.601	0.711	<1	1.6	577	136	0.406	0.615	4.71	19.6
1/29/2025	24.8	0.078	0.36	125	84.3	1.05	0.234	7.82	0.534	0.579	<1	2.0	570	151	0.973	1.21	3.93	16.7
2/27/2025	45.6	<0.05	1.07	200	71.6	0.85	0.17	7.38	0.556	0.465	<1	1.8	587	179	0.842	1.01	2.57	18.1
3/26/2025	11.4	0.086	0.72	100	79.1	1.58	0.199	7.23	0.799	0.941	<1	1.4	760	178	0.821	1.02	2.6	19.6
4/15/2025	9.4	<0.05	0.26	60	75.1	1.65	0.086	7.77	0.702	0.914	2.0	2.4	721	167	0.664	0.75	2.26	20.1
5/21/2025	1.6	0.108	0.47	125	78.1	1.98	0.145	8.18	0.581	0.782	1.4	3.2	928	275	0.673	0.818	5.02	25.4
6/25/2025	98.2	0.061	0,52	250	38.3	0.872	<0.04	6.96	0.641	0.821	1.8	2.6	475	112	1.39	1.39	3.39	26.7

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* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corredsonding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Hall's Branch @ Virgil Hall Rd. (KFD SWB-02)
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/18/2024	0.1	0.144	4.12	150	73.9	0.53	0.07	7.4	0.329	0.521	1.8	6.2	268	9.89	1.54	1.61	6.46	24.9
8/28/2024	0.1	0.156	0.65	225	86.5	0.55	0.083	7.41	0.44	0.659	3.4	8.4	321	7.05	2.1	2.18	10.4	26.1
9/25/2024	0.3	0.131	0.74	150	87.4	0.48	0.104	7.22	0.503	0.4	1.2	4.0	227	6.44	0.411	0.515	7.3	26.7
10/29/2024	0.8	0.138	1.01	150	83.6	0.51	0.074	7.6	0.353	0.58	6.0	9.2	218	6.52	0.737	0.811	6.17	21.8
11/13/2024	0.8	0.125	1.57	200	86.5	0.52	0.145	7.73	0.362	0.433	1.4	4.2	233	6.74	0.522	0.667	11.1	23.1
12/17/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1/29/2025	0.6	0.094	0.90	125	93.7	0.44	0.085	7.93	0.206	0.282	3.4	5.2	247	10.4	1.03	1.11	11.1	15.4
2/27/2025	0.8	0.092	1.20	200	81.6	0.44	0.141	7.61	0.23	0.216	3.1	7.3	260	10.7	1.41	1.55	12.4	17.6
3/26/2025	0.7	0.13	3.58	125	89.3	0.44	0.088	7.93	0.185	0.509	10.0	18.0	267	8.63	0.949	1.04	17	17.9
4/15/2025	0.5	0.07	0.33	85	81.0	0.44	0.115	7.64	0.193	0.655	5.6	10.8	277	10	0.729	0.844	11.8	16
5/21/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/25/2025	0.9	<0.05	2.31	125	88.1	0.48	0.22	7.23	0.327	0.404	<1.0	2.6	250	8.38	0.943	1.16	8.8	24.9

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Lake Branch @ Lonesome Mine Rd.
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/17/2024	0.5	0.162	16.10	175	54.6	0.48	<0.04	7.42	0.623	0.82	4.2	10.0	341	31	1.58	1.58	10.4	27
8/27/2024	0.6	0.252	2.28	150	48.6	0.57	0.048	7.51	0.893	0.976	1.4	2.8	315	12.3	1.5	1.55	5.2	27.4
9/19/2024	0.5	0.183	2.27	125	34.8	0.48	0.085	7.51	0.671	0.748	1.0	3.0	324	8.64	0.542	0.627	4.6	26.7
10/30/2024	0.5	0.313	1.76	100	37.2	0.48	0.13	7.34	0.639	0.568	<1	1.2	301	8.45	1.06	1.19	5.21	22.9
11/14/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
12/19/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1/15/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
2/19/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
3/18/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
4/24/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/22/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/18/2025	0.9	0.101	2.35	200	62.6	0.90	0.42	7.08	0.332	0.609	<1	2.4	264	79.8	1.67	2.09	5.9	24.9

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
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Mosaic Fertilizer, LLC
Surface Water Quality Data
Upper Lake Branch
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/18/2024	1.6	0.16	25.30	150	74.7	0.49	<0.04	7.22	0.079	0.227	1.6	11.2	174	1.9	1.06	1.06	18.3	27.6
8/28/2024	3.9	0.187	9.55	150	65.1	0.83	0.153	7.35	0.16	0.366	2.6	7.0	202	1.12	1.53	1.68	15	28
9/19/2024	3.9	0.115	1.92	125	72.1	0.75	0.083	7.69	0.306	0.41	3.8	7.8	227	1.4	0.42	0.503	8.09	26.7
10/29/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
11/13/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
12/19/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1/15/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
2/27/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
3/18/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
4/24/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/21/2025	0.5	0.7	8.82	125	41.3	0.55	0.138	8.02	0.138	0.378	4.6	11.4	218	2.03	1.38	1.52	13.6	26.6
6/25/2025	2.3	0.418	23,5	125	60.1	0.50	0.056	7.41	0.158	0.312	3.6	11.2	178	1.74	1.19	1.25	13.8	28.6

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^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Hurrah Creek @ Hiscock Rd. Bridge
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/25/2024	1.2	0.176	0.75	225	74.8	0.22	0.024	6.64	0.354	0.418	2.8	6.6	200	32.9	2.48	2.5	9.42	26
8/29/2024	1.7	0.266	1.85	600	75.0	0.28	0.039	6.81	0.498	0.611	4.0	7.6	170	18.1	1.64	1.68	14.7	26.5
9/25/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
10/29/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
11/13/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
12/17/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1/29/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
2/27/2025	0.4	0.185	0.41	150	64.5	0.17	<0.04	7.45	0.384	0.268	<1	<1	146	23.1	0.932	0.932	5.27	17.5
3/26/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
4/15/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/21/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/25/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Hurrah Creek @ CR 672
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/25/2024	3.9	0.055	0.39	400	74.0	0.31	0.04	7.21	0.528	0.581	1.0	1.8	283	55.6	2.21	2.25	4.16	27.7
8/29/2024	3.9	0.124	<0.25	600	59.5	0.37	0.077	7.14	0.527	0.612	1.2	1.6	197	20.9	1.61	1.69	3.14	26.3
9/25/2024	3.2	<0.05	0.34	225	66.5	0.32	0.329	6.95	0.504	0.34	<1	2.8	205	24.3	0.818	1.15	4.03	26.8
10/29/2024	4.9	0.084	0.36	150	81.6	0.28	0.32	7.42	0.342	0.388	1.0	2.8	192	26.5	0.599	0.919	5.20	22.2
11/13/2024	4.0	0.076	1.13	180	77.9	0.27	<0.04	7.97	0.377	0.339	2.4	5.8	194	26.1	0.33	0.33	6.68	25.7
12/17/2024	2.7	0.064	0.67	125	84.0	0.30	0.527	7.09	0.294	0.387	2.4	5.2	199	35.9	0.2	0.527	6.96	19.5
1/29/2025	3.2	0.059	<0.25	125	88.3	0.30	0.446	7.81	0.217	0.223	1.8	4.0	262	44.5	0.683	1.13	4.16	15.1
2/27/2025	8.1	<0.05	2.41	250	79.9	0.31	0.195	6.71	0.294	0.177	<1	2.2	267	49.3	0.921	1.12	4.51	16.1
3/26/2025	0.5	<0.05	<0.25	125	83.1	0.27	0.438	7.96	0.288	0.335	<1	1.4	208	33.7	0.633	1.07	2.58	18.7
4/15/2025	0.8	<0.05	0.42	85	79.5	0.27	0.362	7.76	0.298	0.421	2.8	4.0	210	35.3	0.388	0.75	3.76	18.6
5/21/2025	1.6	0.095	0.83	125	75.6	0.28	0.423	8.28	0.428	0.504	1.0	2.6	223	45.3	0.459	0.882	3.42	23.2
6/25/2025	2.4	<0.05	0.25	250	48.1	0.34	0.123	7.2	0.374	0.621	1.8	5.0	251	40.6	1.3	1.42	3.05	25.5

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Upper Boggy
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/17/2024	1.7	0.102	4.79	175	74.3	0.69	<0.04	7.57	0.467	0.557	<1	5.0	192	2.1	1.13	1.13	6.09	27.2
8/27/2024	4.9	0.116	2.14	150	70.5	0.85	0.048	7.6	0.384	0.505	2.4	4.8	226	2.47	3.03	3.08	5.93	27.6
9/19/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
10/30/2024	1.2	<0.05	4.53	100	59.4	0.70	0.152	7.81	0.309	0.438	1.8	4.4	202	1.64	1.07	1.22	6.17	23
11/14/2024	1.0	<0.05	3.36	100	74.6	0.71	0.09	7.91	0.324	0.366	<1	1.0	223	1.29	0.381	0.471	7.79	22.5
12/19/2024	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1/15/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
2/19/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
3/18/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
4/24/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/22/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/18/2025	0.7	0.131	4.04	200	92.6	0.55	0.12	7.46	0.52	0.878	<1	2.8	224	39.6	1.62	1.74	9.28	24.9

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Boggy Branch
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/17/2024	1.0	0.073	7.65	175	79.2	0.70	<0.04	7.49	0.462	0.552	1.4	5.6	177	2.2	1.36	1.36	7.41	27
8/27/2024	7.3	0.092	2.21	150	66.2	0.90	0.058	7.64	0.398	0.521	2.0	4.8	214	4.62	1.68	1.74	5.15	27.5
9/19/2024	4.9	0.114	2.70	125	69.7	0.74	0.081	7.7	0.316	0.423	4.2	9.2	226	1.35	0.49	0.571	6.14	26.9
10/30/2024	2.3	<0.05	4.75	100	72.3	0.73	0.154	7.9	0.271	0.293	1.2	3.6	217	3.82	0.797	0.951	5.33	22.8
11/14/2024	2.7	<0.05	4.34	110	80.3	0.74	0.09	7.83	0.319	0.404	2.2	5.6	225	4.07	0.424	0.514	6.71	21.8
12/19/2024	1.3	0.157	2.69	100	82.2	0.72	0.108	8.03	0.308	0.422	1.2	2.0	218	2.3	0.499	0.607	5.59	20.9
1/15/2025	1.3	0.054	3.22	70	93.4	0.69	0.12	8.14	0.291	0.36	<1	2.0	209	3.55	0.519	0.639	5.38	12.5
2/19/2025	1.3	0.131	0.98	60	80.0	0.68	0.085	7.41	0.356	0.477	1.6	4.0	206	3.93	0.656	0.741	7.42	19.9
3/18/2025	1.0	0.058	1.51	70	78.1	0.62	0.054	7.74	0.385	0.489	2.2	4.2	204	2.65	0.73	0.784	6.15	14.2
4/24/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/22/2025	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/18/2025	1.6	0.054	1.14	200	68.8	0.45	0.398	7.22	0.342	0.585	<1	2.0	294	78.9	1.72	2.12	6.51	24.8

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Little Manatee River @ Dragline Crossing Sec 16
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	3.49	0.088	0.47	500	63.1	0.775	0.022	6.92	1.06	1.11	2.42	4.2	199.2	3.52	8	8.02	3.91	26.4
8/28/24	OOB	0.119	0.26	400	47.5	0.675	0.026	7.11	0.812	0.848	1.32	3.4	289	2.22	1.14	1.17	6.43	28.6
9/24/24	0.96	0.136	0.58	300	58.3	0.69	0.066	6.52	0.613	0.591	1.98	4.8	276	1.55	0.811	0.877	6.11	28.7
10/30/24	0.43	<0.05	0.49	250	62.3	0.645	0.06	7.19	0.388	0.308	<1.1	1	225	1.51	0.89	0.95	2.05	22.3
11/20/24	0.58	0.051	0.34	300	63.8	0.657	0.109	6.75	0.489	0.522	1.76	2.8	213	2.54	0.928	1.04	3.41	21.4
12/18/24	0.27	0.071	0.42	250	68.4	0.71	<0.04	6.77	0.437	0.473	<1.1	1.8	222	7.01	0.371	0.371	3.8	19.6
1/8/25	0.24	<0.05	0.52	250	81	0.602	<0.04	7.02	0.276	0.357	<1.1	1.4	239	7.54	0.606	0.606	2.37	10.9
2/10/25	0.22	<0.05	0.57	200	62.1	0.649	0.053	7.28	0.556	0.357	<1.1	2.8	229	3.58	0.544	0.597	4.51	18.6
3/4/25	0.27	<0.05	0.35	200	73.9	0.672	0.196	7.25	0.505	0.472	<1.1	<1	276	9.27	0.538	0.734	2.33	17.8
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	0.03	0.085	1.13	800	55	0.148	0.094	6.42	0.487	0.496	<1.1	1.6	193	48.8	1.6	1.7	7.53	22.3
6/17/25	0.51	0.087	0.48	350	66.1	0.753	0.045	7.26	0.721	0.961	<1.1	1.2	277	11.5	2.14	2.19	2.06	26

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Little Manatee @ Taylor Gill Rd. Upstream
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	2.03	0.088	0.25	500	70	0.715	0.027	6.87	0.996	1.07	<1.1	5.4	200.2	6.22	3.71	3.74	4.84	26.5
8/28/24	2.58	0.164	0.25	400	51.3	0.673	0.032	7.23	0.801	0.858	2.42	4.4	322	4.02	1.27	1.3	7.04	28.9
9/24/24	0.77	0.11	<0.25	300	61.8	0.694	0.074	6.42	0.573	0.565	3.96	5.6	311	3.79	0.698	0.772	6.18	28.9
10/30/24	0.48	<0.05	<0.25	250	68.5	0.669	0.078	7.37	0.46	0.265	<1.1	1.2	225	5.71	0.96	1.04	3.84	22.6
11/20/24	0.48	0.056	<0.25	300	70.1	0.614	0.14	6.51	0.528	0.629	1.1	3	219	9.7	1.02	1.16	5.65	21.6
12/18/24	0.48	0.085	<0.25	250	70.2	0.622	0.048	7.74	0.481	0.533	2.2	2.4	221	15	0.268	0.316	7.58	19.9
1/8/25	0.46	0.074	<0.25	250	79.9	0.563	<0.04	7.6	0.344	0.402	<1.1	1	235	13.3	1.03	1.03	3.34	11.7
2/10/25	0.43	0.072	<0.25	200	64.3	0.631	0.06	7.11	0.618	0.416	1.54	3	232	14.2	0.657	0.717	6.42	18.7
3/4/25	0.77	0.086	0.32	200	77.8	0.624	0.044	7.31	0.533	0.521	1.98	3	275	13.8	0.542	0.586	5.83	17.9
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	0.06	0.469	1.5	350	50.3	0.283	0.252	6.17	0.769	0.887	3.08	5.6	261	68.1	1.35	1.6	14.2	22.5
6/17/25	0.4	0.108	0.26	500	72.6	0.709	<0.04	7.27	0.792	0.946	1.98	3	276	16.4	1.89	1.89	4.2	26.1

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Little Manatee River @ CR 39
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	5.16	0.101	0.33	500	72.6	0.681	0.116	7.16	0.931	0.982	2.2	3.4	258	23.3	3.56	3.68	5.53	27.2
8/28/24	15.5	0.109	0.55	400	67	0.385	0.025	6.54	0.497	0.563	3.08	3.8	311.2	3.28	2.25	2.27	8.2	29.4
9/24/24	10.1	0.124	0.52	70	87.9	1.04	0.25	7.82	0.305	0.377	4.4	7.2	423	66.9	0.462	0.712	12.9	28.7
10/30/24	1.89	0.191	<0.25	250	77.7	0.617	0.465	7.15	0.549	0.487	3.08	4.4	294	25.3	0.867	1.33	7.32	23.1
11/20/24	3.1	0.064	0.33	150	82.8	0.537	0.836	6.59	0.49	0.58	1.32	1.8	288	31.7	0.785	1.62	6.59	21.6
12/18/24	0.96	0.081	0.55	150	80.8	0.512	0.576	7.36	0.391	0.568	2.2	3.2	282	34.9	0.397	0.973	4.31	20
1/8/25	1.56	0.061	0.5	125	90.4	0.475	0.515	7.42	0.367	0.44	<1.1	1	297	34.7	0.896	1.41	4.02	11.1
2/10/25	1.42	<0.05	0.5	125	84.1	0.54	0.463	7.46	0.468	0.392	2.42	3	297	36	0.437	0.9	4.73	19.3
3/4/25	1.56	<0.05	0.43	200	82.1	0.504	0.041	7.49	0.489	0.521	1.54	2	304	32.2	0.354	0.395	3.76	17.9
4/15/25	0.61	<0.05	0.84	85	76.1	0.41	0.117	7.21	0.397	0.55	1.32	2.6	284	48.1	0.423	0.54	3.44	20.1
5/12/25	2.13	0.064	0.89	175	72.9	0.381	0.619	6.62	0.446	0.511	<1.1	3.4	277	45.3	0.613	1.23	8.02	23.2
6/17/25	3.87	0.052	0.41	350	70.2	0.533	0.192	7.31	0.707	0.944	2.64	2.6	333	48.8	1.58	1.77	7.7	26.2

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Little Manatee River @ SR 674
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	6.78	0.093	<0.25	125	63.8	0.273	0.558	7.17	0.246	0.297	2.2	3.6	269	59.2	2.14	2.7	4.74	26.7
8/28/24	17.9	0.115	0.28	150	40.7	0.186	0.4	6.44	0.252	0.295	1.54	2.8	213.8	48.6	0.874	1.27	6.02	30.4
9/24/24	11.3	0.106	0.28	70	68.1	0.181	0.819	7.6	0.265	0.266	2.2	4.6	259	63.6	0.5	1.32	13.6	29.1
10/30/24	14.5	0.159	<0.25	175	72.7	0.789	0.155	7.16	0.566	0.643	1.1	1.2	319	29.5	0.998	1.15	8.56	25.3
11/20/24	2.9	0.052	0.38	175	86.2	0.578	0.405	6.87	0.492	0.59	<1.1	3.6	275	29.1	0.959	1.36	4.88	23.7
12/18/24	2.9	0.089	0.37	150	90.4	0.508	0.252	6.99	0.369	0.443	1.54	3.4	281	43.5	0.209	0.461	4.04	22
1/8/25	1.74	0.085	<0.25	125	90.2	0.468	0.261	7.37	0.326	0.379	<1.1	1	286	43.4	0.978	1.24	2.74	13.7
2/10/25	1.74	0.111	<0.25	125	104	0.632	0.138	7.69	0.415	0.145	<1.1	<1	288	41	0.4	0.538	2.47	22.4
3/4/25	2.13	0.089	<0.25	200	93.2	0.474	0.129	7.78	0.42	0.419	<1.1	1	305	44.2	0.306	0.435	2.88	21.1
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/17/25	8.48	0.082	<0.25	200	60.4	0.407	0.187	6.71	0.301	0.407	<1.1	1.6	428	138	1.78	1.97	4.29	27.4

OOB = Out Of Banks
NF = No Flow
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* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Little Manatee River @ Grange Hall Loop Rd. Exit
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	OOB	0.085	<0.25	500	66.6	0.579	0.072	7.33	0.637	0.697	1.98	3.6	238	32.6	2.68	2.75	3.92	27.3
8/28/24	OOB	0.095	0.79	400	53.6	0.585	0.089	6.71	0.554	0.624	1.1	2.6	236	31.7	1.82	1.91	5.97	30
9/24/24	7.75	0.131	0.34	125	76.9	0.754	0.281	7.73	0.386	0.364	3.52	5.2	349	50.9	0.867	1.15	10.2	28.3
10/30/24	OOB	0.08	<0.25	175	73.7	0.457	1.04	7.11	0.381	0.303	3.08	4	410	92.3	0.917	1.95	5.63	24.7
11/20/24	5.68	<0.05	<0.25	175	84.9	0.362	1.37	6.86	0.351	0.391	<1.1	2.4	304	56	0.807	2.17	5.29	22.8
12/18/24	1.86	0.084	<0.25	100	87.4	0.324	1.05	7.14	0.247	0.274	1.1	2	343	82.7	0.248	1.3	2.71	21.1
1/8/25	1.86	0.05	<0.25	125	88.1	0.36	1.08	7.77	0.212	0.252	<1.1	1	375	96.3	0.828	1.9	3.49	14.6
2/10/25	1.35	0.089	0.4	100	91.7	0.451	0.956	7.71	0.259	0.181	<1.1	1.8	375	94.4	0.339	1.3	2.13	22.4
3/4/25	2.05	0.071	0.3	200	86.9	0.322	0.612	7.67	0.29	0.271	<1.1	<1	331	64.9	0.358	0.97	2.64	19.7
4/15/25	0.4	0.051	0.27	85	91.1	0.254	0.968	7.38	0.157	0.258	<1.1	1.4	315	67.7	0.689	1.66	1.63	20.7
5/12/25	1.26	0.064	0.28	150	77.5	0.183	0.874	6.65	0.219	0.229	<1.1	1.2	446	139	0.552	1.43	2.83	23.2
6/17/25	OOB	0.099	<0.25	200	46.4	0.267	0.14	6.64	0.579	0.786	<1.1	2	317	83.4	1.54	1.68	2.44	27.3

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NF = No Flow
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# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Alderman Creek @ Ag Crossing Sec 33 xing (SW-3)
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/15/24	1.29	0.12	1.1	350	58.8	0.554	<0.04	6.28	0.684	0.808	<1.1	2.6	378	76.9	1.13	1.13	5.62	25.4
8/29/24	OOB	0.154	1.92	70	48.9	1.05	0.146	7.5	0.297	0.37	1.76	2	351	62.1	0.99	1.14	3.02	29
9/9/24	OOB	0.082	0.71	50	56.5	0.917	0.149	7.49	0.285	0.299	<1.1	1.4	369	50.1	0.662	0.811	1.46	30.4
10/1/24	OOB	<0.05	1.31	60	53	1.26	0.157	7.35	0.193	<0.05	<1.1	<1	444	84.2	0.364	0.521	1.63	28.6
11/11/24	0.51	0.105	0.77	150	66.2	0.899	0.299	7.35	0.591	0.623	1.98	4	376	20.8	0.924	1.22	5.02	28
12/10/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1/20/25	0.31	0.198	0.94	125	60.1	0.744	0.04	6.4	0.417	0.565	<1.1	3.8	324	24.7	1.16	1.2	4.04	16.7
2/11/25	0.1	<0.05	1.32	175	90.3	0.807	0.047	6.94	0.504	2.52	1.54	2.4	380	32.1	0.976	1.02	4.5	23.7
3/18/25	0.16	<0.05	2.04	125	57.3	0.645	<0.04	7.08	0.536	0.672	1.76	2.8	323	31.2	0.94	0.94	4.43	19.6
4/16/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/6/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/18/25	5.06	<0.05	2.18	300	64.5	0.577	0.043	6.38	0.414	0.567	1.1	1.8	487	148	1.27	1.32	9.07	25.4

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Alderman Creek @ Taylor Gill Rd. Downstream
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	1.29	0.162	<0.25	225	80.3	0.537	0.977	6.9	0.753	0.815	3.96	8.2	374	82.3	1.43	2.41	8.49	26
8/28/24	14	0.116	<0.25	400	53.6	0.699	0.028	7.47	0.8	0.888	3.96	4.6	326	3.46	1.81	1.84	7.08	30
9/24/24	8.72	<0.25	0.49	70	81.9	1.08	0.447	7.91	0.278	0.27	5.28	7	444	73.5	0.442	0.889	10.2	27.8
10/30/24	0.64	0.253	0.29	150	82.7	0.637	0.878	7.01	0.559	0.414	<1.1	1.4	332	46.6	0.904	1.78	6.24	22.9
11/20/24	0.69	<0.05	0.25	150	86.5	0.533	1.36	6.42	0.425	0.526	<1.1	2.2	296	48.5	0.702	2.06	5.82	21.7
12/18/24	0.45	0.102	0.57	100	85.7	0.507	1.26	6.28	0.369	0.419	1.76	1.6	293	51.1	<0.2	1.26	3.93	20.1
1/8/25	0.74	0.092	0.31	150	90.7	0.476	1.17	6.31	0.329	0.434	<1.1	1.4	300	50	0.824	1.99	5.44	11.9
2/10/25	0.88	0.053	0.25	100	86.2	0.517	1.24	7.23	0.392	0.172	<1.1	1.2	305	55.2	0.259	1.5	3.68	18.5
3/4/25	0.81	0.076	<0.25	70	87.1	0.426	1.11	7.37	0.395	0.409	<1.1	<1	318	60.2	<0.2	1.11	4.35	17.4
4/15/25	0.34	0.058	0.45	40	80.3	0.359	1.79	7.03	0.285	0.437	1.98	1.8	264	55.7	0.693	2.48	2.61	18.9
5/12/25	0.56	0.217	1.42	150	79.1	0.353	0.927	6.31	0.415	0.539	5.28	7.2	260	62.9	0.405	1.33	13.2	22.1
6/17/25	0.54	0.15	<0.25	200	83.9	0.476	0.548	7.23	0.568	0.587	3.96	6.2	361	90.5	1.44	1.99	10.8	25.2

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Mosaic Fertilizer, LLC
Surface Water Quality Data
Howard's Prairie Downstream
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	0.87	0.057	0.36	500	70.6	0.675	0.02	7.39	0.482	0.498	<1.1	2	334	7.49	3.94	3.96	2.19	26.4
8/28/24	OOB	0.094	4.22	400	39.5	0.281	0.028	6.41	0.628	0.637	<1.1	1.2	262	18	1.85	1.88	9.2	29.6
9/24/24	1.9	0.141	0.38	300	79.2	0.568	0.088	7.81	0.3	0.288	1.32	2.6	266	6.07	0.959	1.05	7.41	26.7
10/30/24	OOB	<0.05	0.34	250	70.4	0.544	0.119	7.28	0.229	0.191	<1.1	1	239	6.28	0.974	1.09	2.32	23.3
11/20/24	0.43	<0.05	0.25	250	62.8	0.566	0.204	6.78	0.305	0.358	<1.1	1	280	9.68	1.22	1.43	2.37	21.6
12/18/24	0.29	0.108	0.5	250	58.4	0.555	0.092	7.01	0.261	0.288	<1.1	1.6	291	15.9	0.964	1.06	3	20
1/8/25	0.2	0.08	<0.25	250	83.5	0.592	<0.04	7.75	0.139	0.142	<1.1	<1	327	14.7	1.7	1.7	1.73	12.3
2/10/25	0.26	<0.05	0.56	200	68.2	0.72	<0.04	7.56	0.216	<0.05	3.08	4.4	336	10.2	1.12	1.12	1.54	19.3
3/4/25	1.01	0.08	0.53	200	76.7	0.575	<0.04	7.56	0.23	0.211	<1.1	1.2	331	13.2	0.723	0.723	1.96	18.2
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/17/25	4.01	0.242	0.28	350	51.5	0.441	<0.04	7.05	0.742	0.903	1.32	2.8	235	21.7	2.48	2.48	2.75	26.2

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Tributary to Howard's Prairie
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
8/28/24	OOB	0.087	1.28	600	63.3	0.376	0.026	7.69	0.498	0.578	3.52	5.2	281	3.29	2.27	2.3	9.76	30.2
9/24/24	0.34	0.13	4.36	300	53.2	0.349	0.043	7.47	0.301	0.291	3.3	4.6	235	41.9	0.84	0.883	8.09	27.3
10/30/24	0.05	<0.05	0.54	250	54.1	0.278	0.058	6.96	0.229	0.166	<1.1	1.4	235	51	0.963	1.02	4.04	23.7
11/20/24	0.77	<0.05	0.31	200	54.7	0.268	0.064	6.55	0.198	0.222	<1.1	2	262	62.6	0.947	1.01	2.66	21.6
12/18/24	0.52	0.081	0.34	150	67.6	0.216	<0.04	6.67	0.091	0.099	<1.1	1.6	352	115	0.307	0.307	2.96	19.8
1/8/25	0.28	0.072	<0.25	125	87	0.202	<0.04	7.72	0.075	0.071	<1.1	1	325	98.7	1.36	1.36	1.36	12.7
2/10/25	0.47	0.059	<0.25	125	78.1	0.234	<0.04	7.41	0.101	0.181	<1.1	1.2	351	100	0.665	0.665	1.31	20
3/4/25	1.22	<0.05	0.25	200	66.8	0.242	<0.04	7.57	0.209	0.179	<1.1	<1	336	88.6	0.369	0.369	1.38	18.4
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/17/25	OOB	0.073	0.36	500	16.8	0.271	<0.04	6.41	0.761	1.09	<1.1	7.08	239	47.9	1.79	1.79	4.43	27.4

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Unnamed Tributary to Little Manatee River in Sec 28
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
8/28/24	OOB	0.098	1.1	400	18.7	0.255	0.029	6.4	0.856	0.99	<1.1	3	127	7.22	2.2	2.23	5.44	29.2
9/24/24	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
10/30/24	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
11/20/24	0.05	<0.05	0.27	175	64.1	0.404	0.084	6.77	0.273	0.289	<1.1	2.8	236	11.8	1.84	1.92	2.94	22.2
12/18/24	0.08	0.064	0.43	250	74.8	0.44	<0.04	6.88	0.189	0.196	<1.1	<1	278	22.1	0.583	0.583	2.16	20.1
1/8/25	0.11	0.08	0.43	150	95.7	0.298	0.075	7.46	0.164	0.197	<1.1	1.6	336	66.1	1	1.08	2.36	13
2/10/25	0.1	0.073	0.97	200	82.7	0.468	<0.04	7.52	0.206	0.184	1.21	1.6	296	27.3	0.702	0.702	2.65	21.5
3/4/25	0.19	0.086	0.4	200	86.7	0.293	0.045	7.71	0.276	0.254	1.98	2.4	284	46.8	0.451	0.496	5.01	20.6
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
6/17/25	OOB	0.102	0.36	200	36	0.31	<0.04	6.75	0.449	0.623	<1.1	2.2	304	61.5	1.72	1.72	1.85	27.4

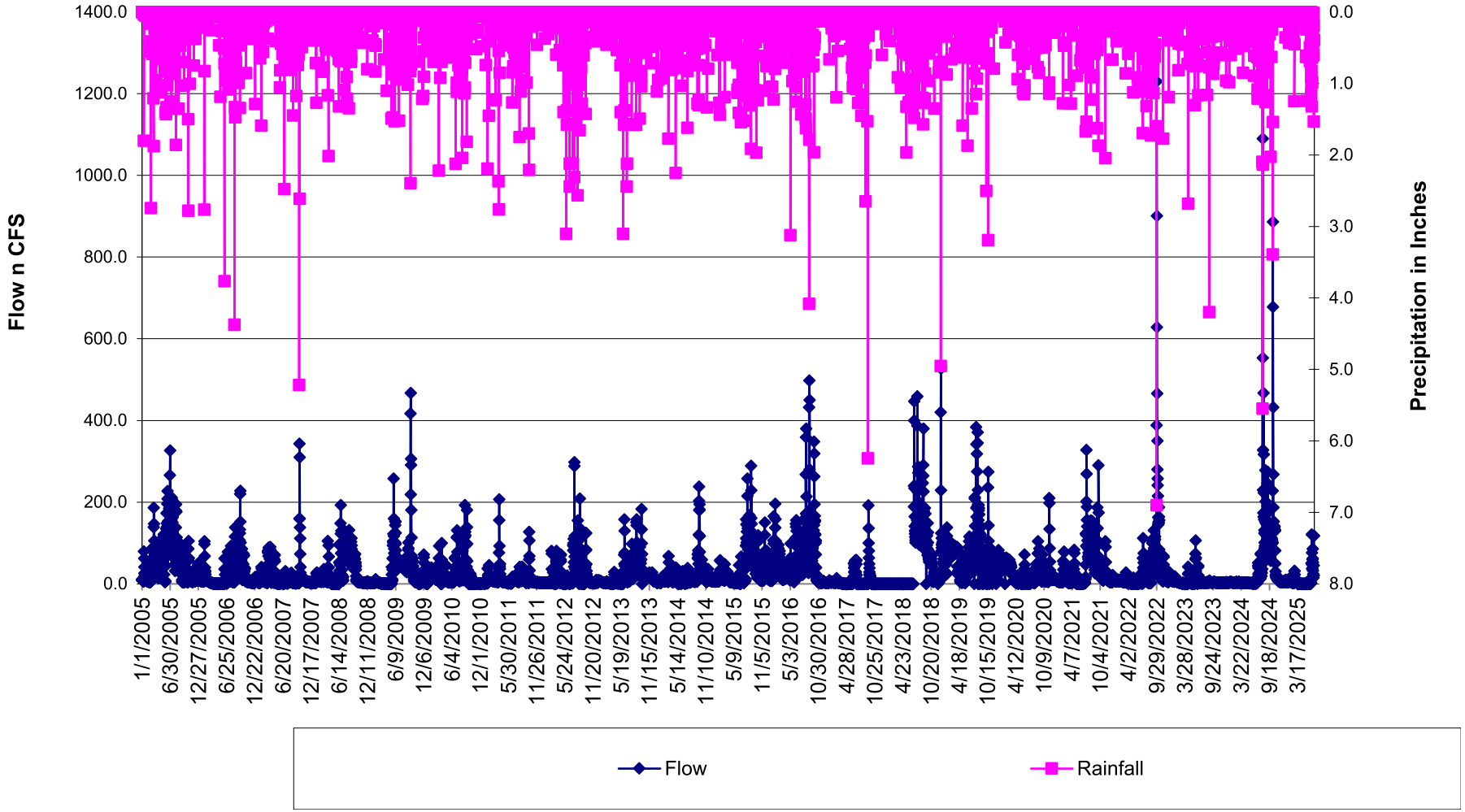
OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Mosaic Fertilizer, LLC
Surface Water Quality Data
Pierce Branch @ Owens Rd.
July 1, 2024 through June 30, 2025

	Flow	Total Ammonia Nitrogen as N (TAN)	Chlorophyll a	Color	Oxygen; Dissolved	Fluoride	Nitrate-Nitrite (NOx)	pH	Ortho-Phosphate (as P)	Total Phosphorous	Non-Volatile;Non-Filterable residue (Fixed Solids)	Suspended Solids;Total (TSS)	Specific Conductance	Sulfate	Nitrogen - Kjeldahl	Total Nitrogen	Turbidity	Temperature
Class III Surface Water standards, 62.302 F.A.C.	N/A	<2.5x calculated value^	<20 annual geomean#	N/A	>38%	<10	NA	6.0-8.5	N/A	< 0.49 Annual GeoMean*	N/A	N/A	<1275	N/A	N/A	<1.65 Annual GeoMean*	<29 above background	N/A
Date	MGD	mg/l	ug/L	PCU	% Saturation	mg/l	mg/l	SU	mg/l	mg/l	mg/l	mg/l	umho/cm	mg/l	mg/l	mg/l	NTU	°C
7/29/24	1.8	0.052	0.43	125	68.7	0.222	0.424	7.15	0.242	0.253	<1.1	1.6	266	58.9	3.92	4.34	4.14	26.8
8/28/24	OOB	0.122	0.31	150	44.3	0.192	0.406	7.8	0.248	0.278	<1.1	2	218	48.5	1.45	1.86	8.77	29.8
9/24/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
10/30/24	0.81	<0.05	<0.25	100	68.3	0.21	2.38	7.15	0.189	0.148	1.32	2.2	312	60.3	0.539	2.92	5.87	25.9
11/20/24	0.48	<0.25	0.35	100	69.3	0.168	1.19	6.84	0.235	0.294	1.32	1.8	257	65.5	0.543	1.73	3.12	23.6
12/18/24	0.36	0.075	<0.25	70	73.8	0.175	1.25	6.74	0.201	0.223	<1.1	1	257	67.7	<0.2	1.25	2.17	21.8
1/8/25	0.32	0.066	<0.25	100	86.4	0.165	1.44	7.13	0.141	0.177	<1.1	<1	262	69.8	0.621	2.06	1.88	14.5
2/10/25	0.34	<0.05	<0.25	85	82.9	0.339	1.32	7.27	0.173	<0.05	<1.1	<1	232	66.3	0.375	1.69	2.33	26.5
3/4/25	0.39	0.09	<0.25	70	80.7	0.149	0.906	7.61	0.208	0.202	<1.1	<1	260	60.4	<0.2	0.906	1.73	21.3
4/15/25	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
5/12/25	0.17	<0.05	0.89	175	62.4	0.189	0.671	6.62	0.28	0.282	<1.1	1.6	313	90.8	0.555	1.23	4.17	22.8
6/17/25	0.7	<0.05	0.73	150	51.9	0.228	1.25	6.68	0.249	0.303	<1.1	2	345	87.5	1.02	2.28	1.66	27.6

OOB = Out Of Banks
NF = No Flow
< - Below laboratory method detection limit
^ - See F.A.C. 62-302.530(3)
# - Chlorophyll -a - Not to be exceeded more than once in any consecutive 3-year period per F.A.C 62-303.450(1)
* - Nutrient thresholds per F.A.C. 62-302.531(2)(c) - exceedance does not indicate impairment without corresponding floral and faunal data.

Average Daily Flow at USGS Station # 02300100: Little Manatee River near Ft. Lonesome



USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
7/1/2024	2.76	2.7
7/2/2024	2.82	3.3
7/3/2024	2.76	2.8
7/4/2024	3.09	6.9
7/5/2024	3.18	8.0
7/6/2024	3.71	17.4
7/7/2024	4.86	44.3
7/8/2024	5.12	51.2
7/9/2024	4.68	39.3
7/10/2024	4.03	23.8
7/11/2024	3.49	13.2
7/12/2024	3.28	9.6
7/13/2024	3.70	17.1
7/14/2024	3.41	11.8
7/15/2024	4.14	26.5
7/16/2024	4.74	40.9
7/17/2024	5.13	51.5
7/18/2024	4.80	42.4
7/19/2024	4.29	29.7
7/20/2024	4.01	23.3
7/21/2024	3.87	20.5
7/22/2024	3.53	13.9
7/23/2024	3.45	12.7
7/24/2024	4.76	41.6
7/25/2024	5.80	72.7
7/26/2024	5.88	75.2
7/27/2024	5.23	54.4
7/28/2024	4.43	33.2
7/29/2024	4.18	27.1
7/30/2024	3.79	18.8
7/31/2024	4.13	26.6

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
8/1/2024	5.73	70.0
8/2/2024	4.98	47.5
8/3/2024	4.55	35.9
8/4/2024	5.03	49.3
8/5/2024	10.34	1260.0
8/6/2024	10.46	1090.0
8/7/2024	9.37	553.0
8/8/2024	8.61	328.0
8/9/2024	8.15	230.0
8/10/2024	7.68	174.0
8/11/2024	7.54	164.0
8/12/2024	9.10	467.0
8/13/2024	8.57	317.0
8/14/2024	8.10	223.0
8/15/2024	7.46	158.0
8/16/2024	7.07	131.0
8/17/2024	6.94	124.0
8/18/2024	6.46	101.0
8/19/2024	6.12	87.2
8/20/2024	6.27	92.7
8/21/2024	6.89	122.0
8/22/2024	7.42	153.0
8/23/2024	7.48	159.0
8/24/2024	8.38	278.0
8/25/2024	7.95	202.0
8/26/2024	7.34	148.0
8/27/2024	6.99	127.0
8/28/2024	7.10	133.0
8/29/2024	6.84	119.0
8/30/2024	6.52	103.0
8/31/2024	6.93	123.0

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
9/1/2024	6.86	119.0
9/2/2024	6.64	108.0
9/3/2024	6.90	123.0
9/4/2024	7.27	144.0
9/5/2024	7.82	190.0
9/6/2024	8.23	246.0
9/7/2024	8.37	274.0
9/8/2024	7.67	174.0
9/9/2024	7.23	141.0
9/10/2024	6.96	125.0
9/11/2024	6.82	117.0
9/12/2024	6.95	124.0
9/13/2024	6.59	107.0
9/14/2024	5.72	73.8
9/15/2024	5.56	68.8
9/16/2024	5.80	76.3
9/17/2024	5.59	69.8
9/18/2024	5.52	67.5
9/19/2024	6.21	90.5
9/20/2024	6.44	99.2
9/21/2024	5.90	80.1
9/22/2024	5.40	64.1
9/23/2024	5.42	64.6
9/24/2024	5.42	64.4
9/25/2024	5.14	56.3
9/26/2024	5.85	81.6
9/27/2024	7.15	144.0
9/28/2024	6.78	121.0
9/29/2024	6.58	110.0
9/30/2024	6.64	113.0

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
10/1/2024	6.38	99.6
10/2/2024	6.39	100.0
10/3/2024	6.59	110.0
10/4/2024	6.83	124.0
10/5/2024	6.81	123.0
10/6/2024	6.53	107.0
10/7/2024	6.37	99.2
10/8/2024	6.43	102.0
10/9/2024	7.04	228.0
10/10/2024	9.96	886.0
10/11/2024	9.51	678.0
10/12/2024	8.82	432.0
10/13/2024	8.16	268.0
10/14/2024	7.64	187.0
10/15/2024	7.27	153.0
10/16/2024	7.05	137.0
10/17/2024	7.05	137.0
10/18/2024	7.07	139.0
10/19/2024	7.05	137.0
10/20/2024	7.10	141.0
10/21/2024	7.07	139.0
10/22/2024	6.98	133.0
10/23/2024	6.96	132.0
10/24/2024	6.93	130.0
10/25/2024	5.89	81.4
10/26/2024	4.92	49.7
10/27/2024	4.17	30.2
10/28/2024	3.86	22.9
10/29/2024	3.73	19.9
10/30/2024	3.64	18.0
10/31/2024	3.61	17.2

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
11/1/2024	3.58	16.6
11/2/2024	3.53	15.5
11/3/2024	3.47	14.2
11/4/2024	3.43	13.3
11/5/2024	3.40	12.7
11/6/2024	3.41	12.6
11/7/2024	3.40	12.5
11/8/2024	3.37	11.8
11/9/2024	3.32	10.9
11/10/2024	3.29	10.1
11/11/2024	3.25	9.4
11/12/2024	3.23	8.9
11/13/2024	3.20	8.3
11/14/2024	3.16	7.7
11/15/2024	3.14	7.2
11/16/2024	3.10	6.6
11/17/2024	3.07	6.1
11/18/2024	3.05	5.7
11/19/2024	3.03	5.3
11/20/2024	3.09	6.0
11/21/2024	3.14	6.7
11/22/2024	3.10	6.2
11/23/2024	3.04	5.4
11/24/2024	3.00	5.0
11/25/2024	2.99	4.7
11/26/2024	2.98	4.6
11/27/2024	2.97	4.6
11/28/2024	2.97	4.5
11/29/2024	2.99	4.7
11/30/2024	3.05	5.5

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
12/1/2024	3.01	5.1
12/2/2024	2.97	4.6
12/3/2024	2.94	4.2
12/4/2024	2.92	4.0
12/5/2024	2.92	4.0
12/6/2024	2.94	4.1
12/7/2024	2.95	4.3
12/8/2024	2.94	4.2
12/9/2024	2.93	4.1
12/10/2024	2.94	4.1
12/11/2024	3.01	5.0
12/12/2024	3.16	7.1
12/13/2024	3.09	6.1
12/14/2024	3.04	5.4
12/15/2024	3.02	5.2
12/16/2024	3.01	5.0
12/17/2024	3.01	5.0
12/18/2024	3.00	4.9
12/19/2024	3.00	4.9
12/20/2024	3.00	4.9
12/21/2024	2.98	4.6
12/22/2024	2.95	4.3
12/23/2024	2.93	4.0
12/24/2024	2.93	4.0
12/25/2024	2.93	4.1
12/26/2024	2.95	4.3
12/27/2024	2.95	4.3
12/28/2024	2.97	4.5
12/29/2024	3.00	4.9
12/30/2024	3.24	8.3
12/31/2024	3.35	10.0

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
1/1/2025	3.29	9.0
1/2/2025	3.16	7.0
1/3/2025	3.07	5.8
1/4/2025	3.01	5.0
1/5/2025	2.97	4.5
1/6/2025	2.96	4.4
1/7/2025	2.97	4.6
1/8/2025	2.97	4.6
1/9/2025	2.94	4.2
1/10/2025	2.92	4.0
1/11/2025	2.95	4.2
1/12/2025	2.96	4.4
1/13/2025	2.94	4.2
1/14/2025	3.00	4.9
1/15/2025	2.99	4.8
1/16/2025	2.94	4.2
1/17/2025	2.93	4.0
1/18/2025	2.93	4.1
1/19/2025	2.95	4.3
1/20/2025	2.96	4.4
1/21/2025	3.01	5.0
1/22/2025	3.41	10.9
1/23/2025	3.53	12.9
1/24/2025	3.54	13.1
1/25/2025	3.40	10.7
1/26/2025	3.29	9.1
1/27/2025	3.22	7.9
1/28/2025	3.17	7.2
1/29/2025	3.13	6.7
1/30/2025	3.10	6.2
1/31/2025	3.06	5.7

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
2/1/2025	3.04	5.4
2/2/2025	3.03	5.3
2/3/2025	3.02	5.1
2/4/2025	3.00	4.9
2/5/2025	2.97	4.6
2/6/2025	2.95	4.3
2/7/2025	2.92	4.0
2/8/2025	2.90	3.7
2/9/2025	2.88	3.5
2/10/2025	2.86	3.3
2/11/2025	2.85	3.1
2/12/2025	2.84	3.0
2/13/2025	2.83	2.9
2/14/2025	2.81	2.7
2/15/2025	2.80	2.6
2/16/2025	2.78	2.4
2/17/2025	2.77	2.4
2/18/2025	2.75	2.2
2/19/2025	2.77	2.3
2/20/2025	2.96	4.4
2/21/2025	2.92	3.9
2/22/2025	2.85	3.2
2/23/2025	2.81	2.7
2/24/2025	3.06	6.3
2/25/2025	4.39	30.8
2/26/2025	4.43	31.7
2/27/2025	4.03	22.8
2/28/2025	3.62	14.6

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
3/1/2025	3.41	10.9
3/2/2025	3.26	8.5
3/3/2025	3.13	6.7
3/4/2025	3.04	5.4
3/5/2025	2.99	4.8
3/6/2025	3.01	5.1
3/7/2025	2.95	4.4
3/8/2025	2.89	3.6
3/9/2025	2.85	3.2
3/10/2025	2.86	3.3
3/11/2025	2.88	3.5
3/12/2025	2.82	2.8
3/13/2025	2.77	2.3
3/14/2025	2.74	2.0
3/15/2025	2.71	1.7
3/16/2025	2.68	1.5
3/17/2025	2.66	1.3
3/18/2025	2.62	1.0
3/19/2025	2.59	0.8
3/20/2025	2.57	0.7
3/21/2025	2.57	0.6
3/22/2025	2.55	0.5
3/23/2025	2.54	0.5
3/24/2025	2.54	0.5
3/25/2025	2.54	0.5
3/26/2025	2.53	0.5
3/27/2025	2.51	0.3
3/28/2025	2.48	0.2
3/29/2025	2.46	0.1
3/30/2025	2.45	0.1
3/31/2025	2.44	0.1

USGS Streamflow Data

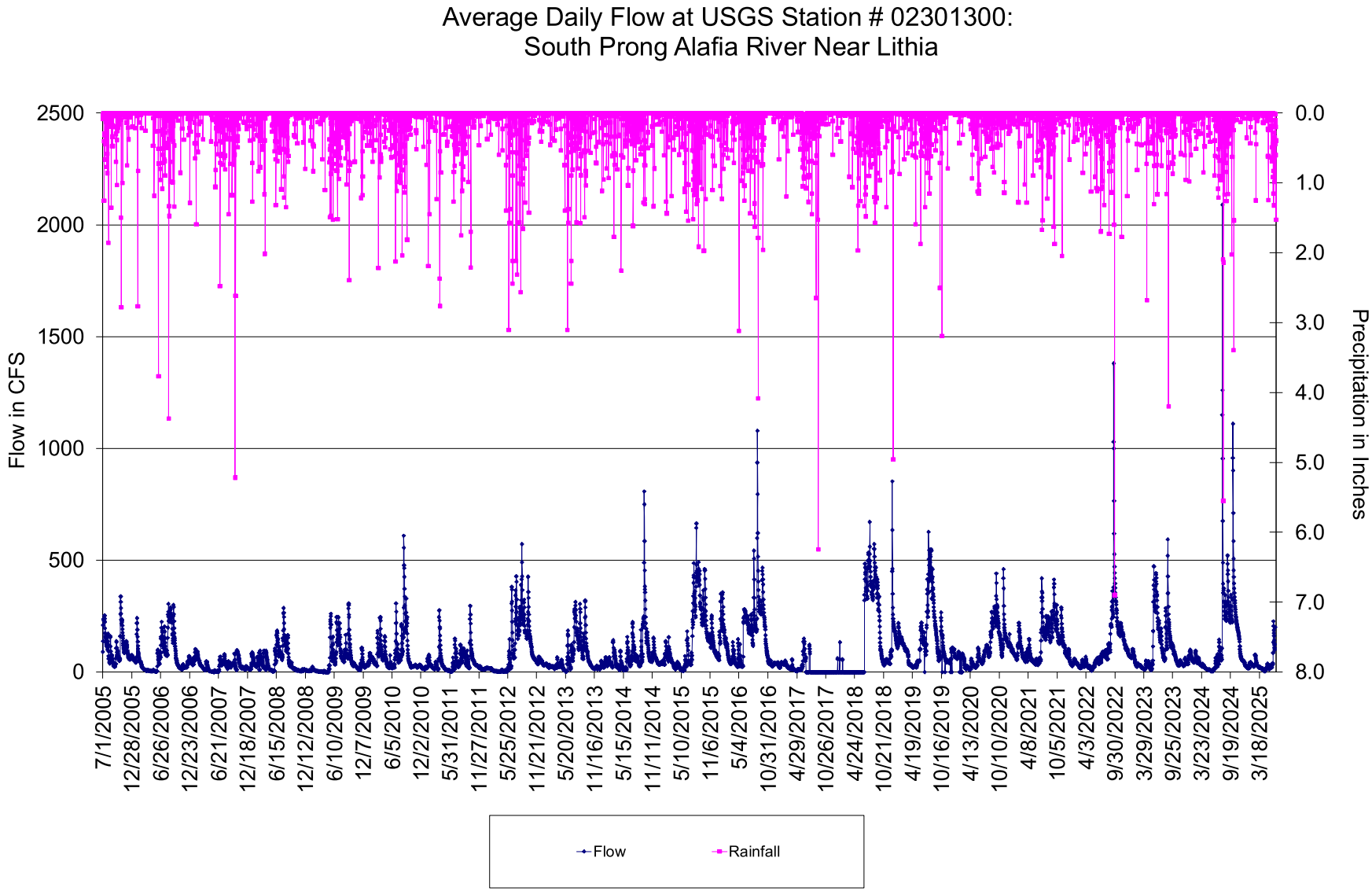
	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
4/1/2025	2.43	0.0
4/2/2025	2.42	0.0
4/3/2025	2.40	0.0
4/4/2025	2.38	0.0
4/5/2025	2.36	0.0
4/6/2025	2.34	0.0
4/7/2025	2.32	0.0
4/8/2025	2.40	0.0
4/9/2025	2.47	0.1
4/10/2025	2.42	0.0
4/11/2025	2.38	0.0
4/12/2025	2.40	0.0
4/13/2025	2.36	0.0
4/14/2025	2.33	0.0
4/15/2025	2.27	0.0
4/16/2025	2.24	0.0
4/17/2025	2.21	0.0
4/18/2025	2.18	0.0
4/19/2025	2.16	0.0
4/20/2025	2.13	0.0
4/21/2025	2.10	0.0
4/22/2025	2.07	0.0
4/23/2025	2.04	0.0
4/24/2025	2.02	0.0
4/25/2025	1.98	0.0
4/26/2025	1.95	0.0
4/27/2025	1.92	0.0
4/28/2025	1.88	0.0
4/29/2025	1.85	0.0
4/30/2025	1.81	0.0

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
5/1/2025	1.78	0.0
5/2/2025	1.75	0.0
5/3/2025	1.72	0.0
5/4/2025	1.70	0.0
5/5/2025	1.67	0.0
5/6/2025	1.65	0.0
5/7/2025	1.62	0.0
5/8/2025	1.59	0.0
5/9/2025	1.57	0.0
5/10/2025	1.65	0.0
5/11/2025	1.81	0.0
5/12/2025	2.22	0.5
5/13/2025	2.86	3.2
5/14/2025	2.75	2.1
5/15/2025	2.59	0.8
5/16/2025	2.49	0.2
5/17/2025	2.43	0.0
5/18/2025	2.39	0.0
5/19/2025	2.35	0.0
5/20/2025	2.29	0.0
5/21/2025	2.23	0.0
5/22/2025	2.19	0.0
5/23/2025	2.15	0.0
5/24/2025	2.11	0.0
5/25/2025	2.07	0.0
5/26/2025	2.03	0.0
5/27/2025	1.99	0.0
5/28/2025	1.96	0.0
5/29/2025	1.91	0.0
5/30/2025	1.88	0.0
5/31/2025	1.94	0.0

USGS Streamflow Data

	LMR @ Ft. Lonesome USGS 02300100	
	Gauge Reading	Flow in
Date(mm/dd)	Feet	CFS
6/1/2025	1.96	0.0
6/2/2025	2.26	0.1
6/3/2025	2.54	0.5
6/4/2025	2.82	2.9
6/5/2025	3.12	6.4
6/6/2025	3.08	5.9
6/7/2025	2.93	4.1
6/8/2025	2.78	2.5
6/9/2025	2.67	1.4
6/10/2025	2.59	0.8
6/11/2025	2.75	2.3
6/12/2025	3.37	10.2
6/13/2025	3.62	14.6
6/14/2025	5.14	50.6
6/15/2025	6.86	121.0
6/16/2025	5.93	76.2
6/17/2025	5.05	47.9
6/18/2025	4.68	38.1
6/19/2025	4.59	36.2
6/20/2025	5.45	59.6
6/21/2025	5.53	62.2
6/22/2025	6.19	86.1
6/23/2025	5.22	52.8
6/24/2025	4.44	32.2
6/25/2025	4.10	24.2
6/26/2025	3.88	19.6
6/27/2025	3.64	14.9
6/28/2025	3.97	21.5
6/29/2025	4.70	45.3
6/30/2025	6.81	118.0


Average Daily Flow at USGS Station # 02301300:
South Prong Alafia River Near Lithia
Flow in CFS
Precipitation in Inches
2500
2000
1500
1000
500
0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
7/1/2005
12/28/2005
6/26/2006
12/23/2006
6/21/2007
12/18/2007
6/15/2008
12/12/2008
6/10/2009
12/7/2009
6/5/2010
12/2/2010
5/31/2011
11/27/2011
5/25/2012
11/21/2012
5/20/2013
11/16/2013
5/15/2014
11/11/2014
5/10/2015
11/6/2015
5/4/2016
10/31/2016
4/29/2017
10/26/2017
4/24/2018
10/21/2018
4/19/2019
10/16/2019
4/13/2020
10/10/2020
4/8/2021
10/5/2021
4/3/2022
9/30/2022
3/29/2023
9/25/2023
3/23/2024
9/19/2024
3/18/2025
Flow
Rainfall

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
7/1/2024	29.7	11.08
7/2/2024	27.7	11.01
7/3/2024	24.4	10.89
7/4/2024	31.3	11.13
7/5/2024	24.1	10.88
7/6/2024	27.5	11
7/7/2024	44.3	11.51
7/8/2024	74.3	12.22
7/9/2024	79.7	12.33
7/10/2024	71.4	12.16
7/11/2024	59.9	11.91
7/12/2024	48	11.62
7/13/2024	39.3	11.38
7/14/2024	35.3	11.26
7/15/2024	72.7	12.18
7/16/2024	115	12.95
7/17/2024	145	13.41
7/18/2024	134	13.26
7/19/2024	112	12.91
7/20/2024	111	12.88
7/21/2024	94.7	12.61
7/22/2024	69.1	12.11
7/23/2024	57	11.84
7/24/2024	65.3	12.03
7/25/2024	79.7	12.32
7/26/2024	109	12.86
7/27/2024	99.7	12.7
7/28/2024	77.1	12.28
7/29/2024	59.6	11.9
7/30/2024	52	11.72
7/31/2024	75.8	12.25

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
8/1/2024	75.9	12.25
8/2/2024	65.4	12.03
8/3/2024	57.6	11.86
8/4/2024	107	12.72
8/5/2024	1150	16.69
8/6/2024	2090	17.91
8/7/2024	1260	17.06
8/8/2024	955	16.67
8/9/2024	676	16.21
8/10/2024	490	15.8
8/11/2024	395	15.49
8/12/2024	355	15.34
8/13/2024	365	15.39
8/14/2024	375	15.44
8/15/2024	351	15.33
8/16/2024	316	15.15
8/17/2024	293	15.01
8/18/2024	272	14.85
8/19/2024	252	14.68
8/20/2024	238	14.55
8/21/2024	290	14.98
8/22/2024	308	15.12
8/23/2024	307	15.11
8/24/2024	301	15.06
8/25/2024	344	15.3
8/26/2024	297	15.04
8/27/2024	270	14.84
8/28/2024	251	14.68
8/29/2024	237	14.55
8/30/2024	231	14.48
8/31/2024	231	14.49

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
9/1/2024	232	14.5
9/2/2024	237	14.55
9/3/2024	238	14.56
9/4/2024	263	14.78
9/5/2024	316	15.14
9/6/2024	522	15.99
9/7/2024	520	15.99
9/8/2024	484	15.87
9/9/2024	438	15.7
9/10/2024	456	15.77
9/11/2024	406	15.57
9/12/2024	364	15.39
9/13/2024	335	15.25
9/14/2024	313	15.14
9/15/2024	303	15.09
9/16/2024	294	15.02
9/17/2024	281	14.92
9/18/2024	271	14.84
9/19/2024	261	14.77
9/20/2024	256	14.72
9/21/2024	249	14.66
9/22/2024	240	14.58
9/23/2024	232	14.49
9/24/2024	225	14.42
9/25/2024	221	14.37
9/26/2024	240	14.57
9/27/2024	294	15.02
9/28/2024	346	15.31
9/29/2024	333	15.24
9/30/2024	295	15.02

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
10/1/2024	274	14.87
10/2/2024	252	14.69
10/3/2024	240	14.58
10/4/2024	237	14.55
10/5/2024	230	14.48
10/6/2024	226	14.43
10/7/2024	227	14.45
10/8/2024	223	14.4
10/9/2024	325	14.95
10/10/2024	958	16.9
10/11/2024	1110	17.13
10/12/2024	902	16.81
10/13/2024	711	16.45
10/14/2024	586	16.18
10/15/2024	507	15.95
10/16/2024	456	15.78
10/17/2024	425	15.66
10/18/2024	397	15.55
10/19/2024	375	15.46
10/20/2024	354	15.37
10/21/2024	336	15.29
10/22/2024	320	15.22
10/23/2024	309	15.17
10/24/2024	296	15.1
10/25/2024	288	15.04
10/26/2024	280	14.99
10/27/2024	269	14.91
10/28/2024	258	14.83
10/29/2024	249	14.77
10/30/2024	243	14.73
10/31/2024	237	14.67

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
11/1/2024	230	14.61
11/2/2024	224	14.56
11/3/2024	220	14.51
11/4/2024	215	14.46
11/5/2024	209	14.4
11/6/2024	205	14.37
11/7/2024	201	14.32
11/8/2024	198	14.29
11/9/2024	194	14.25
11/10/2024	190	14.21
11/11/2024	188	14.18
11/12/2024	184	14.15
11/13/2024	179	14.1
11/14/2024	175	14.04
11/15/2024	171	14.01
11/16/2024	167	13.96
11/17/2024	163	13.91
11/18/2024	158	13.85
11/19/2024	153	13.78
11/20/2024	147	13.71
11/21/2024	136	13.55
11/22/2024	116	13.25
11/23/2024	102	13.02
11/24/2024	92.3	12.86
11/25/2024	85.7	12.75
11/26/2024	80.7	12.66
11/27/2024	76.3	12.58
11/28/2024	72.4	12.5
11/29/2024	69.7	12.45
11/30/2024	67	12.4

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
12/1/2024	64.2	12.35
12/2/2024	61.6	12.29
12/3/2024	59.7	12.26
12/4/2024	58.3	12.23
12/5/2024	57.2	12.21
12/6/2024	55.7	12.18
12/7/2024	54	12.15
12/8/2024	52.3	12.12
12/9/2024	51	12.09
12/10/2024	49.9	12.07
12/11/2024	50.9	12.09
12/12/2024	54.1	12.17
12/13/2024	52.7	12.14
12/14/2024	51.9	12.12
12/15/2024	51.1	12.1
12/16/2024	49.9	12.07
12/17/2024	48.7	12.04
12/18/2024	47.7	12.01
12/19/2024	46.8	11.99
12/20/2024	45.9	11.97
12/21/2024	44.8	11.94
12/22/2024	43.3	11.9
12/23/2024	40.9	11.83
12/24/2024	37.3	11.72
12/25/2024	33.4	11.6
12/26/2024	30.2	11.5
12/27/2024	28	11.43
12/28/2024	26.8	11.38
12/29/2024	26.6	11.37
12/30/2024	29.4	11.47
12/31/2024	29.3	11.47

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
1/1/2025	28.3	11.44
1/2/2025	26.4	11.37
1/3/2025	24.5	11.3
1/4/2025	22.8	11.23
1/5/2025	21.4	11.18
1/6/2025	20.4	11.14
1/7/2025	20.1	11.13
1/8/2025	19.4	11.1
1/9/2025	18.7	11.07
1/10/2025	18.3	11.05
1/11/2025	18.3	11.05
1/12/2025	18.5	11.06
1/13/2025	18.2	11.04
1/14/2025	18.9	11.07
1/15/2025	18.6	11.06
1/16/2025	17.9	11.03
1/17/2025	17.2	11
1/18/2025	16.9	10.99
1/19/2025	17.3	11
1/20/2025	17.8	11.02
1/21/2025	20.8	11.13
1/22/2025	34.8	11.57
1/23/2025	39.6	11.66
1/24/2025	42.7	11.7
1/25/2025	41.1	11.65
1/26/2025	42.3	11.69
1/27/2025	44.4	11.74
1/28/2025	44.8	11.75
1/29/2025	43.4	11.72
1/30/2025	41.5	11.67
1/31/2025	39.8	11.62

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
2/1/2025	38.3	11.57
2/2/2025	38	11.56
2/3/2025	38.6	11.58
2/4/2025	38.4	11.58
2/5/2025	36.8	11.53
2/6/2025	35	11.47
2/7/2025	33.3	11.42
2/8/2025	32.5	11.39
2/9/2025	31.9	11.37
2/10/2025	31	11.35
2/11/2025	30.1	11.32
2/12/2025	29.5	11.3
2/13/2025	28.8	11.27
2/14/2025	28.1	11.25
2/15/2025	27.4	11.22
2/16/2025	26	11.17
2/17/2025	25	11.14
2/18/2025	24.3	11.11
2/19/2025	24.5	11.12
2/20/2025	28.5	11.26
2/21/2025	27.8	11.24
2/22/2025	26.8	11.2
2/23/2025	26.7	11.2
2/24/2025	35.5	11.43
2/25/2025	77.6	12.41
2/26/2025	75.4	12.36
2/27/2025	78	12.42
2/28/2025	76.3	12.38

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
3/1/2025	72	12.29
3/2/2025	66.4	12.17
3/3/2025	59	12.01
3/4/2025	51.9	11.84
3/5/2025	46.2	11.69
3/6/2025	42.4	11.59
3/7/2025	38.8	11.49
3/8/2025	36.2	11.41
3/9/2025	33.9	11.34
3/10/2025	32.2	11.29
3/11/2025	31.4	11.26
3/12/2025	30.4	11.22
3/13/2025	30	11.21
3/14/2025	29.7	11.2
3/15/2025	28.3	11.15
3/16/2025	26.6	11.1
3/17/2025	25.4	11.05
3/18/2025	24.1	11
3/19/2025	22.9	10.96
3/20/2025	22	10.92
3/21/2025	21.3	10.9
3/22/2025	20.7	10.87
3/23/2025	20.2	10.85
3/24/2025	19.9	10.84
3/25/2025	19.9	10.84
3/26/2025	21.6	10.91
3/27/2025	19.4	10.82
3/28/2025	21.4	10.9
3/29/2025	22.7	10.95
3/30/2025	20.4	10.86
3/31/2025	19.1	10.8

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
4/1/2025	20.5	10.86
4/2/2025	19.6	10.82
4/3/2025	19.2	10.81
4/4/2025	18.2	10.76
4/5/2025	16.9	10.71
4/6/2025	15.9	10.66
4/7/2025	15.2	10.62
4/8/2025	15.6	10.65
4/9/2025	16	10.67
4/10/2025	15.1	10.62
4/11/2025	14.5	10.59
4/12/2025	16.8	10.7
4/13/2025	16.5	10.69
4/14/2025	14.4	10.58
4/15/2025	12.4	10.48
4/16/2025	10.6	10.38
4/17/2025	9.34	10.3
4/18/2025	8.58	10.25
4/19/2025	7.72	10.19
4/20/2025	7.22	10.16
4/21/2025	6.99	10.14
4/22/2025	6.46	10.1
4/23/2025	5.79	10.05
4/24/2025	6.02	10.07
4/25/2025	5.44	10.02
4/26/2025	4.47	9.93
4/27/2025	4.83	9.96
4/28/2025	4.88	9.97
4/29/2025	4.89	9.97
4/30/2025	4.59	9.94

USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
5/1/2025	7	10.13
5/2/2025	13.4	10.53
5/3/2025	16.4	10.67
5/4/2025	17.7	10.74
5/5/2025	18	10.75
5/6/2025	17.6	10.73
5/7/2025	17.2	10.71
5/8/2025	16.1	10.66
5/9/2025	14.7	10.59
5/10/2025	14.7	10.59
5/11/2025	18.8	10.74
5/12/2025	30.3	11.13
5/13/2025	37.5	11.33
5/14/2025	36.6	11.3
5/15/2025	37	11.31
5/16/2025	35.7	11.28
5/17/2025	33.6	11.21
5/18/2025	30.1	11.1
5/19/2025	25.1	10.92
5/20/2025	20.5	10.74
5/21/2025	17.5	10.61
5/22/2025	15.7	10.53
5/23/2025	14.8	10.48
5/24/2025	14.8	10.49
5/25/2025	15.8	10.53
5/26/2025	15.8	10.53
5/27/2025	15.8	10.53
5/28/2025	15	10.5
5/29/2025	15.1	10.5
5/30/2025	15.3	10.51
5/31/2025	23.1	10.83

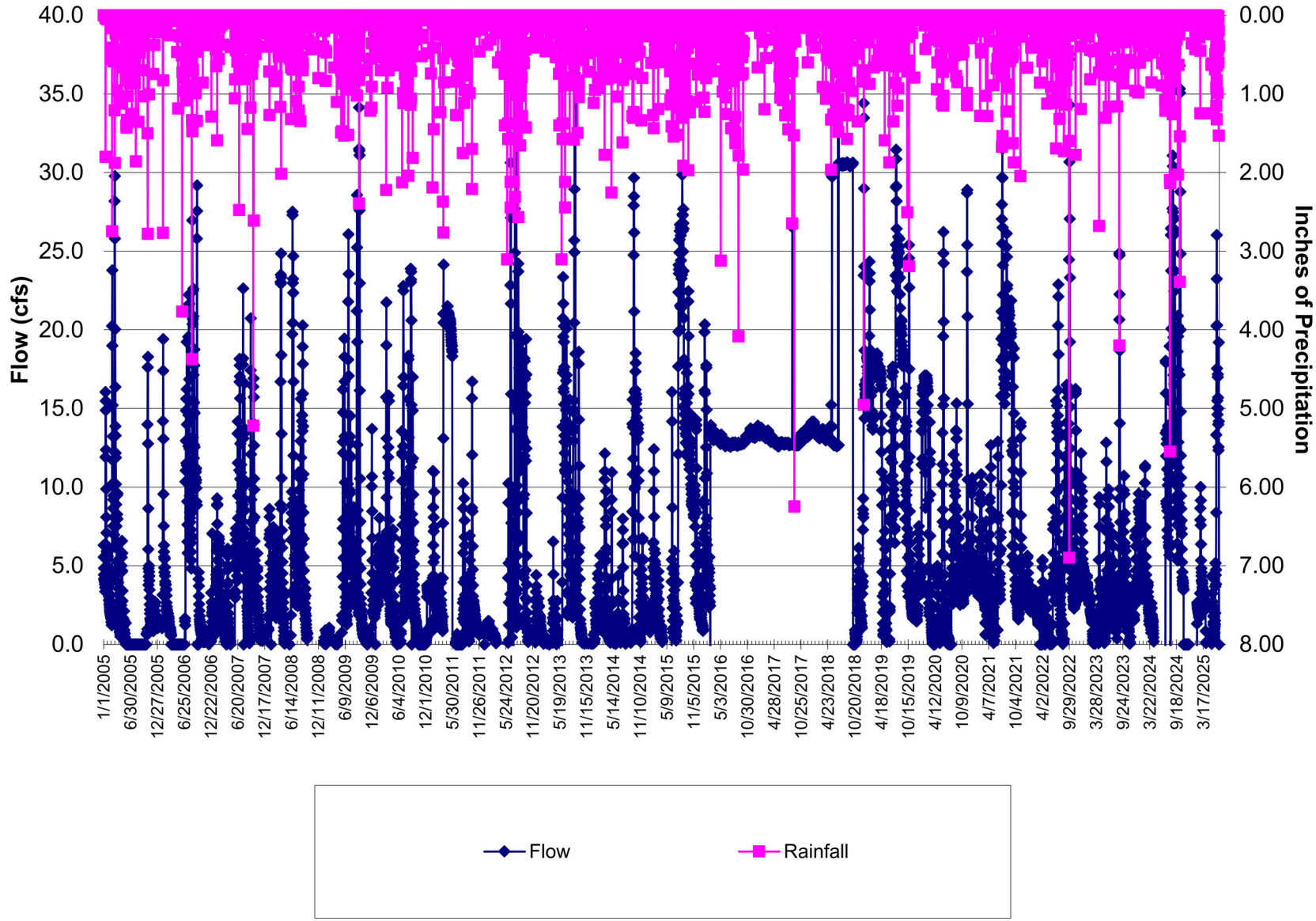
USGS Streamflow Data

SP Alafia Near Lithia

USGS 02301300

Date(mm/dd)	Flow In CFS	Gauge Reading Feet
6/1/2025	27.2	11
6/2/2025	25.2	10.92
6/3/2025	26.3	10.96
6/4/2025	29.6	11.08
6/5/2025	33.1	11.19
6/6/2025	32.5	11.18
6/7/2025	28.9	11.06
6/8/2025	25	10.92
6/9/2025	21.9	10.8
6/10/2025	19.7	10.71
6/11/2025	22	10.8
6/12/2025	32.2	11.16
6/13/2025	31.2	11.13
6/14/2025	33.5	11.21
6/15/2025	37.6	11.33
6/16/2025	40	11.4
6/17/2025	38	11.34
6/18/2025	86.6	12.45
6/19/2025	134	13.22
6/20/2025	227	14.44
6/21/2025	207	14.21
6/22/2025	188	13.98
6/23/2025	175	13.82
6/24/2025	162	13.64
6/25/2025	143	13.39
6/26/2025	121	13.06
6/27/2025	108	12.84
6/28/2025	99.7	12.7
6/29/2025	125	13.08
6/30/2025	201	14.14

PR-4 Tributary to Howards Prairie



Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
7/1/2024	49.30	49.30	49.30	49.30	-2.5
7/2/2024	49.29	49.29	49.29	49.29	-2.5
7/3/2024	49.38	49.38	49.38	49.38	-2.0
7/4/2024	49.39	49.39	49.39	49.39	-1.9
7/5/2024	49.51	49.51	49.51	49.51	-1.2
7/6/2024	49.55	49.55	49.55	49.55	-1.0
7/7/2024	51.79	51.79	51.79	51.79	13.4
7/8/2024	52.46	52.46	52.46	52.46	18.0
7/9/2024	52.44	52.44	52.44	52.44	17.9
7/10/2024	52.16	52.16	52.16	52.16	16.0
7/11/2024	51.57	51.57	51.57	51.57	12.0
7/12/2024	51.13	51.13	51.13	51.13	9.1
7/13/2024	51.11	51.11	51.11	51.11	8.9
7/14/2024	51.68	51.68	51.68	51.68	12.7
7/15/2024	51.81	51.81	51.81	51.81	13.6
7/16/2024	51.73	51.73	51.73	51.73	13.1
7/17/2024	51.44	51.44	51.44	51.44	11.1
7/18/2024	51.08	51.08	51.08	51.08	8.7
7/19/2024	51.04	51.04	51.04	51.04	8.5
7/20/2024	50.85	50.85	50.85	50.85	7.3
7/21/2024	50.85	50.85	50.85	50.85	7.3
7/22/2024	50.78	50.78	50.78	50.78	6.8
7/23/2024	51.29	51.29	51.29	51.29	10.1
7/24/2024	51.84	51.84	51.84	51.84	13.8
7/25/2024	51.86	51.86	51.86	51.86	13.9
7/26/2024	51.69	51.69	51.69	51.69	12.8
7/27/2024	51.34	51.34	51.34	51.34	10.5
7/28/2024	50.97	50.97	50.97	50.97	8.1
7/29/2024	50.73	50.73	50.73	50.73	6.5
7/30/2024	50.70	50.70	50.70	50.70	6.3
7/31/2024	50.69	50.69	50.69	50.69	6.2

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
8/1/2024	50.67	50.67	50.67	50.67	6.1
8/2/2024	50.60	50.60	50.60	50.60	5.7
8/3/2024	51.39	51.39	51.39	51.39	10.8
8/4/2024	52.59	52.59	52.59	52.59	19.0
8/5/2024	55.85	55.85	55.85	55.85	42.8
8/6/2024	55.85	55.85	55.85	55.85	42.8
8/7/2024	55.45	55.45	55.45	55.45	39.8
8/8/2024	55.04	55.04	55.04	55.04	36.6
8/9/2024	47.68	47.68	47.68	47.68	-12.0
8/10/2024	47.68	47.68	47.68	47.68	-12.0
8/11/2024	47.68	47.68	47.68	47.68	-12.0
8/12/2024	53.66	53.66	53.66	53.66	26.4
8/13/2024	53.60	53.60	53.60	53.60	26.0
8/14/2024	53.28	53.28	53.28	53.28	23.8
8/15/2024	52.75	52.75	52.75	52.75	20.1
8/16/2024	52.07	52.07	52.07	52.07	15.3
8/17/2024	52.09	52.09	52.09	52.09	15.5
8/18/2024	52.10	52.10	52.10	52.10	15.6
8/19/2024	51.82	51.82	51.82	51.82	13.7
8/20/2024	51.61	51.61	51.61	51.61	12.2
8/21/2024	51.78	51.78	51.78	51.78	13.4
8/22/2024	51.82	51.82	51.82	51.82	13.7
8/23/2024	53.83	53.83	53.83	53.83	27.7
8/24/2024	54.10	54.10	54.10	54.10	29.7
8/25/2024	54.30	54.30	54.30	54.30	31.1
8/26/2024	54.20	54.20	54.20	54.20	30.4
8/27/2024	53.80	53.80	53.80	53.80	27.5
8/28/2024	53.28	53.28	53.28	53.28	23.8
8/29/2024	52.68	52.68	52.68	52.68	19.5
8/30/2024	52.33	52.33	52.33	52.33	17.1
8/31/2024	52.09	52.09	52.09	52.09	15.5

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
9/1/2024	51.85	51.85	51.85	51.85	13.9
9/2/2024	51.49	51.49	51.49	51.49	11.5
9/3/2024	52.24	52.24	52.24	52.24	16.5
9/4/2024	53.10	53.10	53.10	53.10	22.5
9/5/2024	53.61	53.61	53.61	53.61	26.1
9/6/2024	53.75	53.75	53.75	53.75	27.1
9/7/2024	53.64	53.64	53.64	53.64	26.4
9/8/2024	53.28	53.28	53.28	53.28	23.7
9/9/2024	52.60	52.60	52.60	52.60	19.0
9/10/2024	51.91	51.91	51.91	51.91	14.3
9/11/2024	51.53	51.53	51.53	51.53	11.7
9/12/2024	51.38	51.38	51.38	51.38	10.7
9/13/2024	51.30	51.30	51.30	51.30	10.2
9/14/2024	51.29	51.29	51.29	51.29	10.2
9/15/2024	51.14	51.14	51.14	51.14	9.1
9/16/2024	51.05	51.05	51.05	51.05	8.6
9/17/2024	51.00	51.00	51.00	51.00	8.2
9/18/2024	51.48	51.48	51.48	51.48	11.4
9/19/2024	51.48	51.48	51.48	51.48	11.4
9/20/2024	51.39	51.39	51.39	51.39	10.8
9/21/2024	51.19	51.19	51.19	51.19	9.5
9/22/2024	50.90	50.90	50.90	50.90	7.6
9/23/2024	50.72	50.72	50.72	50.72	6.4
9/24/2024	50.58	50.58	50.58	50.58	5.5
9/25/2024	50.55	50.55	50.55	50.55	5.3
9/26/2024	52.55	52.55	52.55	52.55	18.6
9/27/2024	52.87	52.87	52.87	52.87	20.9
9/28/2024	52.78	52.78	52.78	52.78	20.2
9/29/2024	52.69	52.69	52.69	52.69	19.6
9/30/2024	52.38	52.38	52.38	52.38	17.5

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
10/1/2024	51.70	51.70	51.70	51.70	12.9
10/2/2024	51.46	51.46	51.46	51.46	11.2
10/3/2024	51.35	51.35	51.35	51.35	10.5
10/4/2024	51.29	51.29	51.29	51.29	10.1
10/5/2024	51.11	51.11	51.11	51.11	9.0
10/6/2024	50.95	50.95	50.95	50.95	7.9
10/7/2024	50.90	50.90	50.90	50.90	7.6
10/8/2024	50.91	50.91	50.91	50.91	7.7
10/9/2024	52.33	52.33	52.33	52.33	17.1
10/10/2024	54.87	54.87	54.87	54.87	35.3
10/11/2024	55.06	55.06	55.06	55.06	36.8
10/12/2024	54.83	54.83	54.83	54.83	35.1
10/13/2024	54.46	54.46	54.46	54.46	32.3
10/14/2024	53.98	53.98	53.98	53.98	28.8
10/15/2024	53.43	53.43	53.43	53.43	24.8
10/16/2024	52.74	52.74	52.74	52.74	20.0
10/17/2024	51.99	51.99	51.99	51.99	14.8
10/18/2024	51.57	51.57	51.57	51.57	12.0
10/19/2024	51.36	51.36	51.36	51.36	10.6
10/20/2024	51.18	51.18	51.18	51.18	9.4
10/21/2024	51.06	51.06	51.06	51.06	8.6
10/22/2024	50.94	50.94	50.94	50.94	7.9
10/23/2024	50.87	50.87	50.87	50.87	7.4
10/24/2024	50.81	50.81	50.81	50.81	7.0
10/25/2024	50.66	50.66	50.66	50.66	6.1
10/26/2024	50.53	50.53	50.53	50.53	5.2
10/27/2024	50.43	50.43	50.43	50.43	4.6
10/28/2024	50.38	50.38	50.38	50.38	4.2
10/29/2024	50.34	50.34	50.34	50.34	4.0
10/30/2024	50.31	50.31	50.31	50.31	3.8
10/31/2024	50.35	50.35	50.35	50.35	4.1

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
11/1/2024	50.32	50.32	50.32	50.32	3.9
11/2/2024	50.29	50.29	50.29	50.29	3.7
11/3/2024	50.27	50.27	50.27	50.27	3.6
11/4/2024	50.26	50.26	50.26	50.26	3.5
11/5/2024	50.26	50.26	50.26	50.26	3.5
11/6/2024	0.00	0.00	0.00		0.0
11/7/2024	0.00	0.00	0.00		0.0
11/8/2024	0.00	0.00	0.00		0.0
11/9/2024	0.00	0.00	0.00		0.0
11/10/2024	0.00	0.00	0.00		0.0
11/11/2024	0.00	0.00	0.00		0.0
11/12/2024	0.00	0.00	0.00		0.0
11/13/2024	0.00	0.00	0.00		0.0
11/14/2024	0.00	0.00	0.00		0.0
11/15/2024	0.00	0.00	0.00		0.0
11/16/2024	0.00	0.00	0.00		0.0
11/17/2024	0.00	0.00	0.00		0.0
11/18/2024	0.00	0.00	0.00		0.0
11/19/2024	0.00	0.00	0.00		0.0
11/20/2024	0.00	0.00	0.00		0.0
11/21/2024	0.00	0.00	0.00		0.0
11/22/2024	0.00	0.00	0.00		0.0
11/23/2024	0.00	0.00	0.00		0.0
11/24/2024	0.00	0.00	0.00		0.0
11/25/2024	0.00	0.00	0.00		0.0
11/26/2024	0.00	0.00	0.00		0.0
11/27/2024	0.00	0.00	0.00		0.0
11/28/2024	0.00	0.00	0.00		0.0
11/29/2024	0.00	0.00	0.00		0.0
11/30/2024	0.00	0.00	0.00		0.0

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
12/1/2024	0.00	0.00	0.00		0.0
12/2/2024	0.00	0.00	0.00		0.0
12/3/2024	0.00	0.00	0.00		0.0
12/4/2024	0.00	0.00	0.00		0.0
12/5/2024	0.00	0.00	0.00		0.0
12/6/2024	0.00	0.00	0.00		0.0
12/7/2024	0.00	0.00	0.00		0.0
12/8/2024	0.00	0.00	0.00		0.0
12/9/2024	0.00	0.00	0.00		0.0
12/10/2024	0.00	0.00	0.00		0.0
12/11/2024	49.25	49.25	49.25	49.25	-2.8
12/12/2024	49.26	49.26	49.26	49.26	-2.7
12/13/2024	49.26	49.26	49.26	49.26	-2.7
12/14/2024	49.25	49.25	49.25	49.25	-2.8
12/15/2024	49.25	49.25	49.25	49.25	-2.8
12/16/2024	49.26	49.26	49.26	49.26	-2.8
12/17/2024	49.26	49.26	49.26	49.26	-2.7
12/18/2024	49.27	49.27	49.27	49.27	-2.7
12/19/2024	49.27	49.27	49.27	49.27	-2.7
12/20/2024	49.26	49.26	49.26	49.26	-2.7
12/21/2024	49.25	49.25	49.25	49.25	-2.8
12/22/2024	49.24	49.24	49.24	49.24	-2.9
12/23/2024	49.24	49.24	49.24	49.24	-2.9
12/24/2024	49.24	49.24	49.24	49.24	-2.9
12/25/2024	49.24	49.24	49.24	49.24	-2.9
12/26/2024	49.24	49.24	49.24	49.24	-2.9
12/27/2024	49.24	49.24	49.24	49.24	-2.8
12/28/2024	49.24	49.24	49.24	49.24	-2.8
12/29/2024	49.27	49.27	49.27	49.27	-2.7
12/30/2024	49.34	49.34	49.34	49.34	-2.2
12/31/2024	49.38	49.38	49.38	49.38	-2.0

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
1/1/2025	49.40	49.40	49.40	49.40	-1.9
1/2/2025	49.39	49.39	49.39	49.39	-1.9
1/3/2025	49.38	49.38	49.38	49.38	-2.0
1/4/2025	49.36	49.36	49.36	49.36	-2.1
1/5/2025	49.34	49.34	49.34	49.34	-2.3
1/6/2025	49.32	49.32	49.32	49.32	-2.3
1/7/2025	49.32	49.32	49.32	49.32	-2.4
1/8/2025	49.30	49.30	49.30	49.30	-2.5
1/9/2025	49.30	49.30	49.30	49.30	-2.5
1/10/2025	49.31	49.31	49.31	49.31	-2.4
1/11/2025	49.33	49.33	49.33	49.33	-2.3
1/12/2025	49.32	49.32	49.32	49.32	-2.4
1/13/2025	49.31	49.31	49.31	49.31	-2.4
1/14/2025	49.33	49.33	49.33	49.33	-2.3
1/15/2025	49.31	49.31	49.31	49.31	-2.4
1/16/2025	49.31	49.31	49.31	49.31	-2.4
1/17/2025	49.32	49.32	49.32	49.32	-2.3
1/18/2025	49.33	49.33	49.33	49.33	-2.3
1/19/2025	49.34	49.34	49.34	49.34	-2.2
1/20/2025	49.33	49.33	49.33	49.33	-2.3
1/21/2025	49.34	49.34	49.34	49.34	-2.2
1/22/2025	49.46	49.46	49.46	49.46	-1.5
1/23/2025	49.54	49.54	49.54	49.54	-1.0
1/24/2025	49.61	49.61	49.61	49.61	-0.6
1/25/2025	49.60	49.60	49.60	49.60	-0.6
1/26/2025	49.57	49.57	49.57	49.57	-0.8
1/27/2025	49.53	49.53	49.53	49.53	-1.1
1/28/2025	49.49	49.49	49.49	49.49	-1.3
1/29/2025	49.47	49.47	49.47	49.47	-1.4
1/30/2025	49.45	49.45	49.45	49.45	-1.5
1/31/2025	49.45	49.45	49.45	49.45	-1.6

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
2/1/2025	49.45	49.45	49.45	49.45	-1.6
2/2/2025	49.44	49.44	49.44	49.44	-1.6
2/3/2025	49.43	49.43	49.43	49.43	-1.7
2/4/2025	49.92	49.92	49.92	49.92	1.3
2/5/2025	50.13	50.13	50.13	50.13	2.7
2/6/2025	50.11	50.11	50.11	50.11	2.6
2/7/2025	50.10	50.10	50.10	50.10	2.5
2/8/2025	50.08	50.08	50.08	50.08	2.3
2/9/2025	50.07	50.07	50.07	50.07	2.3
2/10/2025	50.06	50.06	50.06	50.06	2.2
2/11/2025	50.05	50.05	50.05	50.05	2.2
2/12/2025	50.04	50.04	50.04	50.04	2.1
2/13/2025	50.03	50.03	50.03	50.03	2.0
2/14/2025	50.02	50.02	50.02	50.02	2.0
2/15/2025	50.01	50.01	50.01	50.01	1.9
2/16/2025	50.00	50.00	50.00	50.00	1.9
2/17/2025	49.99	49.99	49.99	49.99	1.8
2/18/2025	49.97	49.97	49.97	49.97	1.7
2/19/2025	50.00	50.00	50.00	50.00	1.8
2/20/2025	50.07	50.07	50.07	50.07	2.3
2/21/2025	50.05	50.05	50.05	50.05	2.2
2/22/2025	50.05	50.05	50.05	50.05	2.1
2/23/2025	50.06	50.06	50.06	50.06	2.2
2/24/2025	50.22	50.22	50.22	50.22	3.2
2/25/2025	50.95	50.95	50.95	50.95	7.9
2/26/2025	51.06	51.06	51.06	51.06	8.7
2/27/2025	51.27	51.27	51.27	51.27	10.0
2/28/2025	51.14	51.14	51.14	51.14	9.2

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
3/1/2025	50.90	50.90	50.90	50.90	7.6
3/2/2025	50.71	50.71	50.71	50.71	6.4
3/3/2025	50.55	50.55	50.55	50.55	5.3
3/4/2025	50.47	50.47	50.47	50.47	4.8
3/5/2025	50.43	50.43	50.43	50.43	4.6
3/6/2025	50.40	50.40	50.40	50.40	4.4
3/7/2025	50.36	50.36	50.36	50.36	4.1
3/8/2025	50.34	50.34	50.34	50.34	4.0
3/9/2025	50.34	50.34	50.34	50.34	4.0
3/10/2025	50.34	50.34	50.34	50.34	4.0
3/11/2025	50.32	50.32	50.32	50.32	3.9
3/12/2025	50.29	50.29	50.29	50.29	3.7
3/13/2025	50.27	50.27	50.27	50.27	3.5
3/14/2025	50.26	50.26	50.26	50.26	3.5
3/15/2025	50.26	50.26	50.26	50.26	3.5
3/16/2025	50.25	50.25	50.25	50.25	3.4
3/17/2025	50.24	50.24	50.24	50.24	3.3
3/18/2025	50.19	50.19	50.19	50.19	3.1
3/19/2025	50.17	50.17	50.17	50.17	2.9
3/20/2025	50.16	50.16	50.16	50.16	2.9
3/21/2025	50.14	50.14	50.14	50.14	2.7
3/22/2025	50.12	50.12	50.12	50.12	2.6
3/23/2025	50.11	50.11	50.11	50.11	2.5
3/24/2025	50.11	50.11	50.11	50.11	2.6
3/25/2025	50.12	50.12	50.12	50.12	2.6
3/26/2025	50.10	50.10	50.10	50.10	2.5
3/27/2025	50.09	50.09	50.09	50.09	2.4
3/28/2025	50.09	50.09	50.09	50.09	2.4
3/29/2025	50.08	50.08	50.08	50.08	2.4
3/30/2025	50.11	50.11	50.11	50.11	2.5
3/31/2025	50.10	50.10	50.10	50.10	2.5

Location PR-#4 Trib to Howard Prairie Data

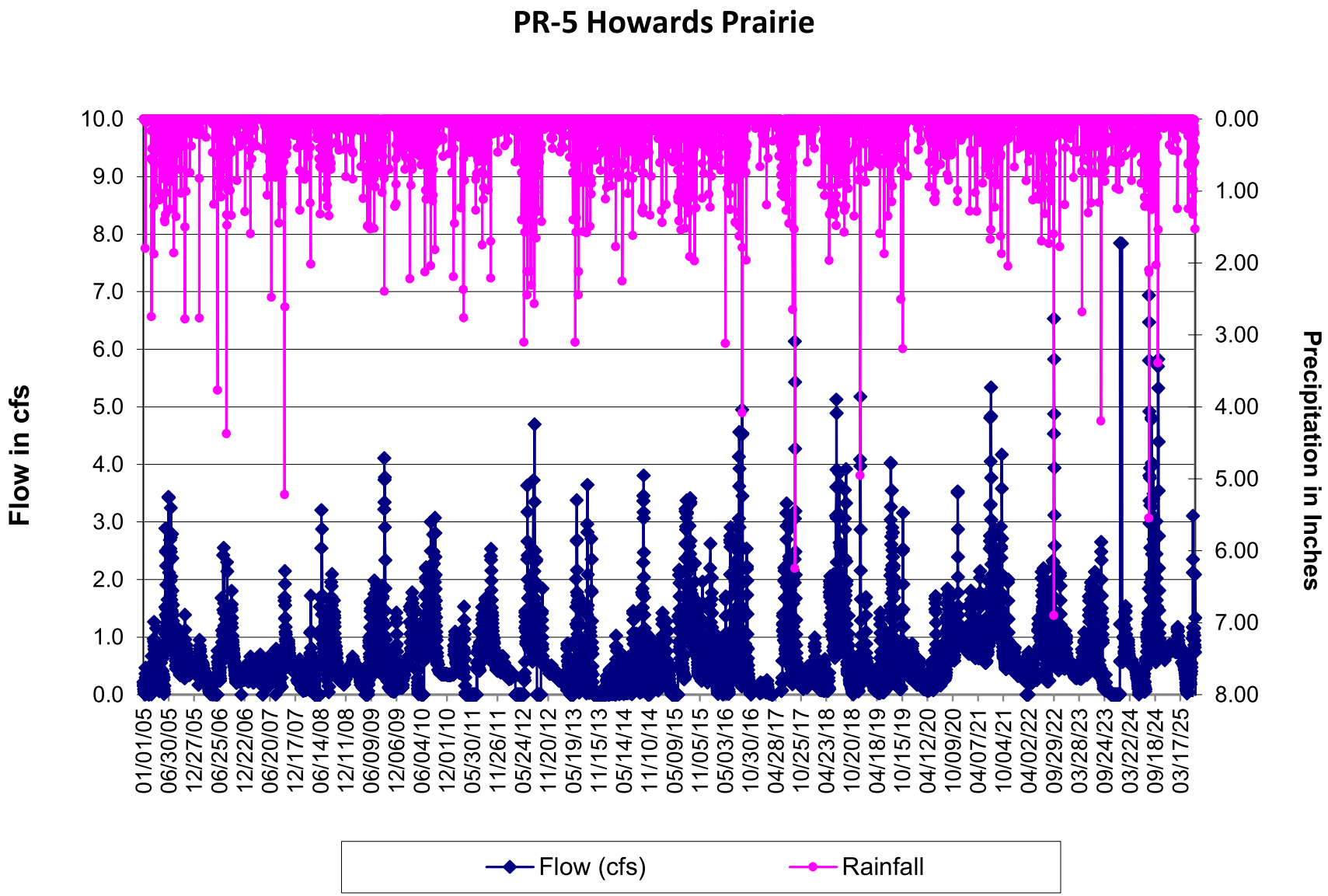
Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
4/1/2025	50.06	50.06	50.06	50.06	2.2
4/2/2025	49.84	49.84	49.84	49.84	0.9
4/3/2025	49.72	49.72	49.72	49.72	0.1
4/4/2025	49.70	49.70	49.70	49.70	0.0
4/5/2025	49.70	49.70	49.70	49.70	0.0
4/6/2025	49.73	49.73	49.73	49.73	0.1
4/7/2025	49.68	49.68	49.68	49.68	-0.2
4/8/2025	49.70	49.70	49.70	49.70	0.0
4/9/2025	49.67	49.67	49.67	49.67	-0.2
4/10/2025	49.65	49.65	49.65	49.65	-0.3
4/11/2025	49.66	49.66	49.66	49.66	-0.3
4/12/2025	49.64	49.64	49.64	49.64	-0.4
4/13/2025	49.63	49.63	49.63	49.63	-0.5
4/14/2025	49.62	49.62	49.62	49.62	-0.5
4/15/2025	49.60	49.60	49.60	49.60	-0.7
4/16/2025	49.58	49.58	49.58	49.58	-0.7
4/17/2025	49.55	49.55	49.55	49.55	-0.9
4/18/2025	49.54	49.54	49.54	49.54	-1.0
4/19/2025	49.56	49.56	49.56	49.56	-0.9
4/20/2025	49.52	49.52	49.52	49.52	-1.1
4/21/2025	49.50	49.50	49.50	49.50	-1.3
4/22/2025	49.49	49.49	49.49	49.49	-1.3
4/23/2025	49.46	49.46	49.46	49.46	-1.5
4/24/2025	49.43	49.43	49.43	49.43	-1.7
4/25/2025	49.41	49.41	49.41	49.41	-1.8
4/26/2025	49.40	49.40	49.40	49.40	-1.9
4/27/2025	49.38	49.38	49.38	49.38	-2.0
4/28/2025	49.34	49.34	49.34	49.34	-2.2
4/29/2025	49.32	49.32	49.32	49.32	-2.3
4/30/2025	49.31	49.31	49.31	49.31	-2.4

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
5/1/2025	49.28	49.28	49.28	49.28	-2.6
5/2/2025	49.28	49.28	49.28	49.28	-2.6
5/3/2025	49.24	49.24	49.24	49.24	-2.8
5/4/2025	49.22	49.22	49.22	49.22	-2.9
5/5/2025	49.24	49.24	49.24	49.24	-2.9
5/6/2025	49.22	49.22	49.22	49.22	-3.0
5/7/2025	49.20	49.20	49.20	49.20	-3.1
5/8/2025	49.19	49.19	49.19	49.19	-3.1
5/9/2025	49.19	49.19	49.19	49.19	-3.2
5/10/2025	49.28	49.28	49.28	49.28	-2.6
5/11/2025	49.48	49.48	49.48	49.48	-1.4
5/12/2025	49.71	49.71	49.71	49.71	0.0
5/13/2025	49.78	49.78	49.78	49.78	0.5
5/14/2025	49.76	49.76	49.76	49.76	0.4
5/15/2025	49.76	49.76	49.76	49.76	0.3
5/16/2025	50.40	50.40	50.40	50.40	4.4
5/17/2025	50.38	50.38	50.38	50.38	4.3
5/18/2025	50.22	50.22	50.22	50.22	3.2
5/19/2025	50.14	50.14	50.14	50.14	2.7
5/20/2025	50.10	50.10	50.10	50.10	2.5
5/21/2025	50.07	50.07	50.07	50.07	2.3
5/22/2025	50.05	50.05	50.05	50.05	2.2
5/23/2025	49.99	49.99	49.99	49.99	1.8
5/24/2025	49.93	49.93	49.93	49.93	1.4
5/25/2025	49.91	49.91	49.91	49.91	1.3
5/26/2025	49.91	49.91	49.91	49.91	1.3
5/27/2025	49.90	49.90	49.90	49.90	1.2
5/28/2025	49.85	49.85	49.85	49.85	0.9
5/29/2025	49.81	49.81	49.81	49.81	0.7
5/30/2025	49.77	49.77	49.77	49.77	0.4
5/31/2025	49.82	49.82	49.82	49.82	0.8

Location PR-#4 Trib to Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
6/1/2025	49.87	49.87	49.87	49.87	1.0
6/2/2025	49.89	49.89	49.89	49.89	1.2
6/3/2025	49.91	49.91	49.91	49.91	1.3
6/4/2025	49.95	49.95	49.95	49.95	1.5
6/5/2025	50.02	50.02	50.02	50.02	2.0
6/6/2025	50.29	50.29	50.29	50.29	3.7
6/7/2025	50.52	50.52	50.52	50.52	5.2
6/8/2025	50.53	50.53	50.53	50.53	5.2
6/9/2025	50.40	50.40	50.40	50.40	4.4
6/10/2025	50.31	50.31	50.31	50.31	3.8
6/11/2025	50.46	50.46	50.46	50.46	4.7
6/12/2025	51.02	51.02	51.02	51.02	8.4
6/13/2025	51.77	51.77	51.77	51.77	13.3
6/14/2025	52.78	52.78	52.78	52.78	20.2
6/15/2025	53.60	53.60	53.60	53.60	26.0
6/16/2025	53.21	53.21	53.21	53.21	23.2
6/17/2025	52.79	52.79	52.79	52.79	20.3
6/18/2025	52.39	52.39	52.39	52.39	17.5
6/19/2025	52.09	52.09	52.09	52.09	15.5
6/20/2025	51.96	51.96	51.96	51.96	14.6
6/21/2025	52.02	52.02	52.02	52.02	15.0
6/22/2025	52.31	52.31	52.31	52.31	17.0
6/23/2025	52.34	52.34	52.34	52.34	17.2
6/24/2025	52.12	52.12	52.12	52.12	15.7
6/25/2025	52.02	52.02	52.02	52.02	15.0
6/26/2025	51.86	51.86	51.86	51.86	14.0
6/27/2025	51.65	51.65	51.65	51.65	12.6
6/28/2025	51.62	51.62	51.62	51.62	12.3
6/29/2025	51.89	51.89	51.89	51.89	14.2
6/30/2025	52.63	52.63	52.63	52.63	19.2


PR-5 Howards Prairie
Flow in cfs
Precipitation in Inches
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
01/01/05
06/30/05
12/27/05
06/25/06
12/22/06
06/20/07
12/17/07
06/14/08
12/11/08
06/09/09
12/06/09
06/04/10
12/01/10
05/30/11
11/26/11
05/24/12
11/20/12
05/19/13
11/15/13
05/14/14
11/10/14
05/09/15
11/05/15
05/03/16
10/30/16
04/28/17
10/25/17
04/23/18
10/20/18
04/18/19
10/15/19
04/12/20
10/09/20
04/07/21
10/04/21
04/02/22
09/29/22
03/28/23
09/24/23
03/22/24
09/18/24
03/17/25
Flow (cfs)
Rainfall

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
7/1/2024	56.68	56.68	56.68	56.68	0.37
7/2/2024	56.56	56.56	56.56	56.56	0.23
7/3/2024	56.49	56.49	56.49	56.49	0.16
7/4/2024	56.39	56.39	56.39	56.39	0.05
7/5/2024	56.54	56.54	56.54	56.54	0.22
7/6/2024	56.43	56.43	56.43	56.43	0.09
7/7/2024	56.42	56.42	56.42	56.42	0.09
7/8/2024	56.46	56.46	56.46	56.46	0.12
7/9/2024	56.43	56.43	56.43	56.43	0.09
7/10/2024	56.43	56.43	56.43	56.43	0.09
7/11/2024	56.4	56.4	56.4	56.40	0.06
7/12/2024	56.76	56.76	56.76	56.76	0.46
7/13/2024	56.79	56.79	56.79	56.79	0.49
7/14/2024	56.87	56.87	56.87	56.87	0.58
7/15/2024	56.91	56.91	56.91	56.91	0.62
7/16/2024	56.92	56.92	56.92	56.92	0.63
7/17/2024	56.9	56.9	56.9	56.90	0.61
7/18/2024	56.89	56.89	56.89	56.89	0.60
7/19/2024	56.89	56.89	56.89	56.89	0.60
7/20/2024	57.02	57.02	57.02	57.02	0.75
7/21/2024	57.25	57.25	57.25	57.25	1.00
7/22/2024	57.29	57.29	57.29	57.29	1.04
7/23/2024	57.31	57.31	57.31	57.31	1.07
7/24/2024	57.27	57.27	57.27	57.27	1.03
7/25/2024	57.22	57.22	57.22	57.22	0.97
7/26/2024	57.18	57.18	57.18	57.18	0.93
7/27/2024	57.1	57.1	57.1	57.10	0.84
7/28/2024	57.12	57.12	57.12	57.12	0.86
7/29/2024	57.44	57.44	57.44	57.44	1.22
7/30/2024	57.48	57.48	57.48	57.48	1.26
7/31/2024	57.62	57.62	57.62	57.62	1.42

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
8/1/2024	57.62	57.62	57.62	57.62	1.42
8/2/2024	57.53	57.53	57.53	57.53	1.32
8/3/2024	57.41	57.41	57.41	57.41	1.18
8/4/2024	57.99	57.99	57.99	57.99	1.84
8/5/2024	62.13	62.13	62.13	62.13	6.94
8/6/2024	61.77	61.77	61.77	61.77	6.47
8/7/2024	61.26	61.26	61.26	61.26	5.81
8/8/2024	60.55	60.55	60.55	60.55	4.92
8/9/2024	59.65	59.65	59.65	59.65	3.81
8/10/2024	58.96	58.96	58.96	58.96	2.98
8/11/2024	59.29	59.29	59.29	59.29	3.37
8/12/2024	59.76	59.76	59.76	59.76	3.94
8/13/2024	59.61	59.61	59.61	59.61	3.76
8/14/2024	59.22	59.22	59.22	59.22	3.29
8/15/2024	58.6	58.6	58.6	58.60	2.55
8/16/2024	58.2	58.2	58.2	58.20	2.09
8/17/2024	58.09	58.09	58.09	58.09	1.95
8/18/2024	57.85	57.85	57.85	57.85	1.68
8/19/2024	57.6	57.6	57.6	57.60	1.40
8/20/2024	57.6	57.6	57.6	57.60	1.40
8/21/2024	57.84	57.84	57.84	57.84	1.67
8/22/2024	57.8	57.8	57.8	57.80	1.63
8/23/2024	60.44	60.44	60.44	60.44	4.78
8/24/2024	60.47	60.47	60.47	60.47	4.81
8/25/2024	59.83	59.83	59.83	59.83	4.03
8/26/2024	59.2	59.2	59.2	59.20	3.26
8/27/2024	58.5	58.5	58.5	58.50	2.44
8/28/2024	58.14	58.14	58.14	58.14	2.02
8/29/2024	57.99	57.99	57.99	57.99	1.84
8/30/2024	57.8	57.8	57.8	57.80	1.62
8/31/2024	57.63	57.63	57.63	57.63	1.43

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
9/1/2024	57.45	57.45	57.45	57.45	1.23
9/2/2024	57.56	57.56	57.56	57.56	1.35
9/3/2024	59.07	59.07	59.07	59.07	3.11
9/4/2024	59.31	59.31	59.31	59.31	3.40
9/5/2024	59.81	59.81	59.81	59.81	4.00
9/6/2024	59.39	59.39	59.39	59.39	3.49
9/7/2024	58.72	58.72	58.72	58.72	2.70
9/8/2024	58.2	58.2	58.2	58.20	2.09
9/9/2024	57.82	57.82	57.82	57.82	1.65
9/10/2024	57.65	57.65	57.65	57.65	1.45
9/11/2024	57.54	57.54	57.54	57.54	1.33
9/12/2024	57.47	57.47	57.47	57.47	1.25
9/13/2024	57.34	57.34	57.34	57.34	1.10
9/14/2024	57.22	57.22	57.22	57.22	0.97
9/15/2024	57.13	57.13	57.13	57.13	0.87
9/16/2024	57.04	57.04	57.04	57.04	0.77
9/17/2024	56.96	56.96	56.96	56.96	0.68
9/18/2024	58.29	58.29	58.29	58.29	2.19
9/19/2024	57.17	57.17	57.17	57.17	0.92
9/20/2024	57.19	57.19	57.19	57.19	0.93
9/21/2024	57.12	57.12	57.12	57.12	0.86
9/22/2024	57.02	57.02	57.02	57.02	0.75
9/23/2024	56.94	56.94	56.94	56.94	0.66
9/24/2024	56.85	56.85	56.85	56.85	0.56
9/25/2024	57.24	57.24	57.24	57.24	0.99
9/26/2024	58.8	58.8	58.8	58.80	2.78
9/27/2024	58.99	58.99	58.99	58.99	3.01
9/28/2024	58.51	58.51	58.51	58.51	2.45
9/29/2024	58.14	58.14	58.14	58.14	2.02
9/30/2024	57.81	57.81	57.81	57.81	1.64

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
10/1/2024	57.71	57.71	57.71	57.71	1.52
10/2/2024	57.46	57.46	57.46	57.46	1.24
10/3/2024	57.39	57.39	57.39	57.39	1.16
10/4/2024	57.31	57.31	57.31	57.31	1.07
10/5/2024	57.22	57.22	57.22	57.22	0.97
10/6/2024	57.19	57.19	57.19	57.19	0.94
10/7/2024	57.17	57.17	57.17	57.17	0.91
10/8/2024	57.15	57.15	57.15	57.15	0.89
10/9/2024	61.17	61.17	61.17	61.17	5.70
10/10/2024	61.27	61.27	61.27	61.27	5.83
10/11/2024	60.87	60.87	60.87	60.87	5.32
10/12/2024	60.13	60.13	60.13	60.13	4.40
10/13/2024	59.43	59.43	59.43	59.43	3.54
10/14/2024	58.77	58.77	58.77	58.77	2.76
10/15/2024	58.3	58.3	58.3	58.30	2.20
10/16/2024	57.96	57.96	57.96	57.96	1.81
10/17/2024	57.66	57.66	57.66	57.66	1.46
10/18/2024	57.44	57.44	57.44	57.44	1.21
10/19/2024	57.31	57.31	57.31	57.31	1.07
10/20/2024	57.22	57.22	57.22	57.22	0.97
10/21/2024	57.17	57.17	57.17	57.17	0.92
10/22/2024	57.08	57.08	57.08	57.08	0.81
10/23/2024	57.05	57.05	57.05	57.05	0.78
10/24/2024	57.03	57.03	57.03	57.03	0.76
10/25/2024	57.06	57.06	57.06	57.06	0.79
10/26/2024	57.05	57.05	57.05	57.05	0.77
10/27/2024	57.06	57.06	57.06	57.06	0.80
10/28/2024	57.11	57.11	57.11	57.11	0.84
10/29/2024	57.12	57.12	57.12	57.12	0.86
10/30/2024	57.13	57.13	57.13	57.13	0.87
10/31/2024	57.12	57.12	57.12	57.12	0.86

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
11/1/2024	57.14	57.14	57.14	57.14	0.88
11/2/2024	57.13	57.13	57.13	57.13	0.87
11/3/2024	57.09	57.09	57.09	57.09	0.82
11/4/2024	57.08	57.08	57.08	57.08	0.82
11/5/2024	57.09	57.09	57.09	57.09	0.83
11/6/2024	57	57	57	57.00	0.72
11/7/2024	57.02	57.02	57.02	57.02	0.75
11/8/2024	57.02	57.02	57.02	57.02	0.75
11/9/2024	56.98	56.98	56.98	56.98	0.70
11/10/2024	57.01	57.01	57.01	57.01	0.74
11/11/2024	56.97	56.97	56.97	56.97	0.69
11/12/2024	56.96	56.96	56.96	56.96	0.67
11/13/2024	56.95	56.95	56.95	56.95	0.66
11/14/2024	56.94	56.94	56.94	56.94	0.65
11/15/2024	57.02	57.02	57.02	57.02	0.75
11/16/2024	57.03	57.03	57.03	57.03	0.76
11/17/2024	56.93	56.93	56.93	56.93	0.65
11/18/2024	56.94	56.94	56.94	56.94	0.66
11/19/2024	56.95	56.95	56.95	56.95	0.67
11/20/2024	56.97	56.97	56.97	56.97	0.69
11/21/2024	57	57	57	57.00	0.73
11/22/2024	56.94	56.94	56.94	56.94	0.65
11/23/2024	56.92	56.92	56.92	56.92	0.63
11/24/2024	56.91	56.91	56.91	56.91	0.63
11/25/2024	56.89	56.89	56.89	56.89	0.60
11/26/2024	56.99	56.99	56.99	56.99	0.72
11/27/2024	56.94	56.94	56.94	56.94	0.66
11/28/2024	57	57	57	57.00	0.72
11/29/2024	57	57	57	57.00	0.72
11/30/2024	57.01	57.01	57.01	57.01	0.73

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
12/1/2024	56.99	56.99	56.99	56.99	0.71
12/2/2024	56.97	56.97	56.97	56.97	0.69
12/3/2024	56.97	56.97	56.97	56.97	0.69
12/4/2024	56.98	56.98	56.98	56.98	0.70
12/5/2024	57	57	57	57.00	0.73
12/6/2024	56.98	56.98	56.98	56.98	0.70
12/7/2024	56.96	56.96	56.96	56.96	0.68
12/8/2024	56.98	56.98	56.98	56.98	0.70
12/9/2024	56.97	56.97	56.97	56.97	0.69
12/10/2024	56.98	56.98	56.98	56.98	0.70
12/11/2024	57.08	57.08	57.08	57.08	0.82
12/12/2024	57	57	57	57.00	0.72
12/13/2024	56.99	56.99	56.99	56.99	0.72
12/14/2024	56.98	56.98	56.98	56.98	0.70
12/15/2024	57	57	57	57.00	0.73
12/16/2024	57	57	57	57.00	0.73
12/17/2024	57	57	57	57.00	0.72
12/18/2024	57.02	57.02	57.02	57.02	0.74
12/19/2024	57	57	57	57.00	0.72
12/20/2024	57.02	57.02	57.02	57.02	0.75
12/21/2024	57	57	57	57.00	0.73
12/22/2024	57	57	57	57.00	0.72
12/23/2024	57	57	57	57.00	0.72
12/24/2024	57	57	57	57.00	0.72
12/25/2024	57.01	57.01	57.01	57.01	0.73
12/26/2024	57.01	57.01	57.01	57.01	0.74
12/27/2024	57.03	57.03	57.03	57.03	0.76
12/28/2024	57.04	57.04	57.04	57.04	0.76
12/29/2024	57.11	57.11	57.11	57.11	0.85
12/30/2024	57.09	57.09	57.09	57.09	0.82
12/31/2024	57.14	57.14	57.14	57.14	0.88

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
1/1/2025	57.13	57.13	57.13	57.13	0.87
1/2/2025	57.04	57.04	57.04	57.04	0.76
1/3/2025	57.07	57.07	57.07	57.07	0.80
1/4/2025	57.08	57.08	57.08	57.08	0.81
1/5/2025	57.05	57.05	57.05	57.05	0.78
1/6/2025	57.08	57.08	57.08	57.08	0.82
1/7/2025	57.08	57.08	57.08	57.08	0.81
1/8/2025	57.07	57.07	57.07	57.07	0.80
1/9/2025	57.06	57.06	57.06	57.06	0.79
1/10/2025	57.06	57.06	57.06	57.06	0.79
1/11/2025	57.06	57.06	57.06	57.06	0.80
1/12/2025	57.07	57.07	57.07	57.07	0.80
1/13/2025	57.07	57.07	57.07	57.07	0.81
1/14/2025	57.08	57.08	57.08	57.08	0.82
1/15/2025	57.08	57.08	57.08	57.08	0.81
1/16/2025	57.09	57.09	57.09	57.09	0.83
1/17/2025	57.04	57.04	57.04	57.04	0.77
1/18/2025	57.03	57.03	57.03	57.03	0.76
1/19/2025	57.04	57.04	57.04	57.04	0.77
1/20/2025	57.05	57.05	57.05	57.05	0.78
1/21/2025	57.04	57.04	57.04	57.04	0.76
1/22/2025	57.09	57.09	57.09	57.09	0.83
1/23/2025	57.1	57.1	57.1	57.10	0.84
1/24/2025	57.15	57.15	57.15	57.15	0.89
1/25/2025	57.13	57.13	57.13	57.13	0.87
1/26/2025	57.11	57.11	57.11	57.11	0.85
1/27/2025	57.1	57.1	57.1	57.10	0.83
1/28/2025	57.09	57.09	57.09	57.09	0.83
1/29/2025	57.09	57.09	57.09	57.09	0.82
1/30/2025	57.1	57.1	57.1	57.10	0.83
1/31/2025	57.08	57.08	57.08	57.08	0.81

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
2/1/2025	57.08	57.08	57.08	57.08	0.82
2/2/2025	57.08	57.08	57.08	57.08	0.82
2/3/2025	57.06	57.06	57.06	57.06	0.79
2/4/2025	57.04	57.04	57.04	57.04	0.77
2/5/2025	57.04	57.04	57.04	57.04	0.77
2/6/2025	57.06	57.06	57.06	57.06	0.79
2/7/2025	57.05	57.05	57.05	57.05	0.78
2/8/2025	57.03	57.03	57.03	57.03	0.76
2/9/2025	57.03	57.03	57.03	57.03	0.76
2/10/2025	57.01	57.01	57.01	57.01	0.74
2/11/2025	57.04	57.04	57.04	57.04	0.77
2/12/2025	57.03	57.03	57.03	57.03	0.76
2/13/2025	57.04	57.04	57.04	57.04	0.77
2/14/2025	57.04	57.04	57.04	57.04	0.77
2/15/2025	57.02	57.02	57.02	57.02	0.75
2/16/2025	57.04	57.04	57.04	57.04	0.76
2/17/2025	57.03	57.03	57.03	57.03	0.76
2/18/2025	57.03	57.03	57.03	57.03	0.75
2/19/2025	57.02	57.02	57.02	57.02	0.74
2/20/2025	57.04	57.04	57.04	57.04	0.77
2/21/2025	57.03	57.03	57.03	57.03	0.75
2/22/2025	57.01	57.01	57.01	57.01	0.74
2/23/2025	57.03	57.03	57.03	57.03	0.75
2/24/2025	57.37	57.37	57.37	57.37	1.14
2/25/2025	57.33	57.33	57.33	57.33	1.09
2/26/2025	57.4	57.4	57.4	57.40	1.18
2/27/2025	57.34	57.34	57.34	57.34	1.11
2/28/2025	57.26	57.26	57.26	57.26	1.02

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
3/1/2025	57.2	57.2	57.2	57.20	0.95
3/2/2025	57.16	57.16	57.16	57.16	0.90
3/3/2025	57.13	57.13	57.13	57.13	0.87
3/4/2025	57.12	57.12	57.12	57.12	0.85
3/5/2025	57.11	57.11	57.11	57.11	0.85
3/6/2025	57.11	57.11	57.11	57.11	0.85
3/7/2025	57.1	57.1	57.1	57.10	0.83
3/8/2025	57.09	57.09	57.09	57.09	0.83
3/9/2025	57.1	57.1	57.1	57.10	0.83
3/10/2025	57.1	57.1	57.1	57.10	0.84
3/11/2025	57.09	57.09	57.09	57.09	0.83
3/12/2025	57.09	57.09	57.09	57.09	0.83
3/13/2025	57.08	57.08	57.08	57.08	0.82
3/14/2025	57.07	57.07	57.07	57.07	0.80
3/15/2025	57.07	57.07	57.07	57.07	0.80
3/16/2025	57.06	57.06	57.06	57.06	0.79
3/17/2025	57.06	57.06	57.06	57.06	0.79
3/18/2025	57.07	57.07	57.07	57.07	0.80
3/19/2025	57.06	57.06	57.06	57.06	0.79
3/20/2025	57.05	57.05	57.05	57.05	0.77
3/21/2025	57.06	57.06	57.06	57.06	0.79
3/22/2025	57.03	57.03	57.03	57.03	0.76
3/23/2025	57.04	57.04	57.04	57.04	0.77
3/24/2025	57.04	57.04	57.04	57.04	0.77
3/25/2025	57.01	57.01	57.01	57.01	0.74
3/26/2025	57.03	57.03	57.03	57.03	0.75
3/27/2025	57.04	57.04	57.04	57.04	0.77
3/28/2025	56.85	56.85	56.85	56.85	0.56
3/29/2025	56.85	56.85	56.85	56.85	0.56
3/30/2025	56.85	56.85	56.85	56.85	0.55
3/31/2025	56.85	56.85	56.85	56.85	0.56

Location PR #5 Howard Prairie Data

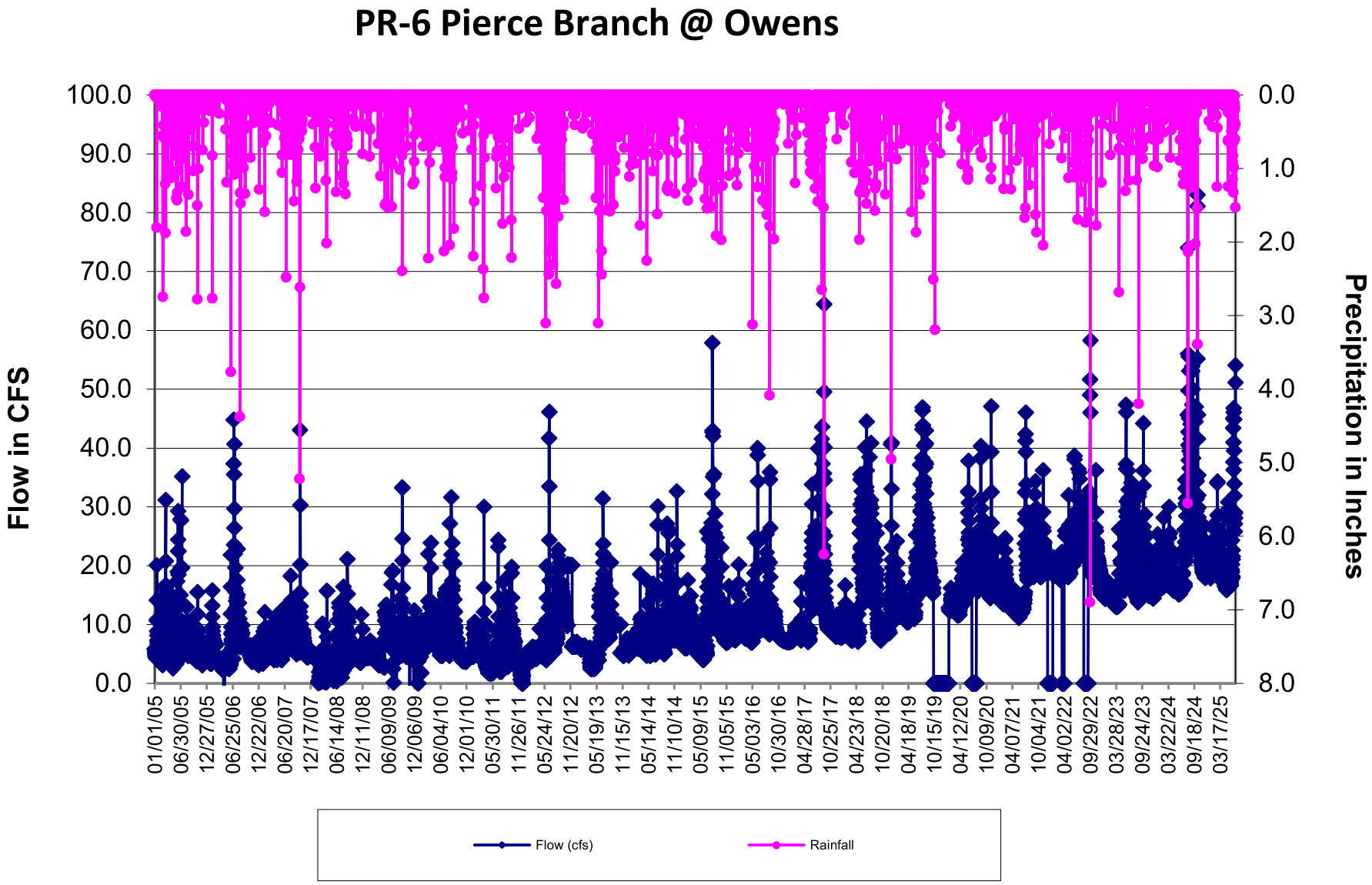
Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
4/1/2025	56.86	56.86	56.86	56.86	0.56
4/2/2025	56.85	56.85	56.85	56.85	0.56
4/3/2025	56.84	56.84	56.84	56.84	0.55
4/4/2025	56.84	56.84	56.84	56.84	0.55
4/5/2025	56.95	56.95	56.95	56.95	0.66
4/6/2025	56.83	56.83	56.83	56.83	0.54
4/7/2025	56.84	56.84	56.84	56.84	0.55
4/8/2025	56.84	56.84	56.84	56.84	0.55
4/9/2025	56.82	56.82	56.82	56.82	0.53
4/10/2025	56.81	56.81	56.81	56.81	0.51
4/11/2025	56.81	56.81	56.81	56.81	0.51
4/12/2025	56.83	56.83	56.83	56.83	0.53
4/13/2025	56.8	56.8	56.8	56.80	0.50
4/14/2025	56.79	56.79	56.79	56.79	0.49
4/15/2025	56.8	56.8	56.8	56.80	0.51
4/16/2025	56.79	56.79	56.79	56.79	0.49
4/17/2025	56.76	56.76	56.76	56.76	0.45
4/18/2025	56.75	56.75	56.75	56.75	0.45
4/19/2025	56.73	56.73	56.73	56.73	0.43
4/20/2025	56.71	56.71	56.71	56.71	0.40
4/21/2025	56.68	56.68	56.68	56.68	0.37
4/22/2025	56.68	56.68	56.68	56.68	0.37
4/23/2025	56.65	56.65	56.65	56.65	0.34
4/24/2025	56.62	56.62	56.62	56.62	0.30
4/25/2025	56.6	56.6	56.6	56.60	0.28
4/26/2025	56.59	56.59	56.59	56.59	0.27
4/27/2025	56.54	56.54	56.54	56.54	0.21
4/28/2025	56.5	56.5	56.5	56.50	0.18
4/29/2025	56.49	56.49	56.49	56.49	0.16
4/30/2025	56.44	56.44	56.44	56.44	0.11

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
5/1/2025	56.42	56.42	56.42	56.42	0.08
5/2/2025	56.4	56.4	56.4	56.40	0.06
5/3/2025	56.36	56.36	56.36	56.36	0.02
5/4/2025	56.38	56.38	56.38	56.38	0.04
5/5/2025	56.34	56.34	56.34	56.34	0.00
5/6/2025	56.31	56.31	56.31	56.31	-0.03
5/7/2025	56.3	56.3	56.3	56.30	-0.05
5/8/2025	56.26	56.26	56.26	56.26	-0.09
5/9/2025	56.39	56.39	56.39	56.39	0.05
5/10/2025	56.9	56.9	56.9	56.90	0.61
5/11/2025	56.84	56.84	56.84	56.84	0.54
5/12/2025	56.9	56.9	56.9	56.90	0.61
5/13/2025	56.85	56.85	56.85	56.85	0.56
5/14/2025	56.85	56.85	56.85	56.85	0.56
5/15/2025	56.86	56.86	56.86	56.86	0.57
5/16/2025	56.85	56.85	56.85	56.85	0.56
5/17/2025	56.86	56.86	56.86	56.86	0.56
5/18/2025	56.84	56.84	56.84	56.84	0.55
5/19/2025	56.84	56.84	56.84	56.84	0.55
5/20/2025	56.84	56.84	56.84	56.84	0.54
5/21/2025	56.81	56.81	56.81	56.81	0.52
5/22/2025	56.8	56.8	56.8	56.80	0.50
5/23/2025	56.74	56.74	56.74	56.74	0.44
5/24/2025	56.69	56.69	56.69	56.69	0.38
5/25/2025	56.64	56.64	56.64	56.64	0.32
5/26/2025	56.6	56.6	56.6	56.60	0.28
5/27/2025	56.54	56.54	56.54	56.54	0.22
5/28/2025	56.51	56.51	56.51	56.51	0.18
5/29/2025	56.85	56.85	56.85	56.85	0.56
5/30/2025	56.66	56.66	56.66	56.66	0.35
5/31/2025	56.85	56.85	56.85	56.85	0.56

Location PR #5 Howard Prairie Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
6/1/2025	56.71	56.71	56.71	56.71	0.41
6/2/2025	56.83	56.83	56.83	56.83	0.54
6/3/2025	56.78	56.78	56.78	56.78	0.48
6/4/2025	56.22	56.22	56.22	56.22	-0.14
6/5/2025	56.17	56.17	56.17	56.17	-0.19
6/6/2025	56.18	56.18	56.18	56.18	-0.17
6/7/2025	56.18	56.18	56.18	56.18	-0.18
6/8/2025	56.16	56.16	56.16	56.16	-0.20
6/9/2025	56.13	56.13	56.13	56.13	-0.23
6/10/2025	56.2	56.2	56.2	56.20	-0.16
6/11/2025	57.05	57.05	57.05	57.05	0.78
6/12/2025	57.23	57.23	57.23	57.23	0.98
6/13/2025	58.23	58.23	58.23	58.23	2.12
6/14/2025	59.07	59.07	59.07	59.07	3.11
6/15/2025	58.43	58.43	58.43	58.43	2.35
6/16/2025	57.41	57.41	57.41	57.41	1.18
6/17/2025	57.4	57.4	57.4	57.40	1.17
6/18/2025	57.31	57.31	57.31	57.31	1.08
6/19/2025	57.28	57.28	57.28	57.28	1.03
6/20/2025	57.39	57.39	57.39	57.39	1.17
6/21/2025	57.38	57.38	57.38	57.38	1.15
6/22/2025	57.38	57.38	57.38	57.38	1.15
6/23/2025	57.28	57.28	57.28	57.28	1.03
6/24/2025	57.2	57.2	57.2	57.20	0.94
6/25/2025	57.13	57.13	57.13	57.13	0.86
6/26/2025	57.08	57.08	57.08	57.08	0.82
6/27/2025	57.02	57.02	57.02	57.02	0.74
6/28/2025	57.01	57.01	57.01	57.01	0.73
6/29/2025	58.2	58.2	58.2	58.20	2.09
6/30/2025	57.54	57.54	57.54	57.54	1.33


PR-6 Pierce Branch @ Owens
Flow in CFS
Precipitation in Inches
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
01/01/05
06/30/05
12/27/05
06/25/06
12/22/06
06/20/07
12/17/07
06/14/08
12/11/08
06/09/09
12/06/09
06/04/10
12/01/10
05/30/11
11/26/11
05/24/12
11/20/12
05/19/13
11/15/13
05/14/14
11/10/14
05/09/15
11/05/15
05/03/16
10/30/16
04/28/17
10/25/17
04/23/18
10/20/18
04/18/19
10/15/19
04/12/20
10/09/20
04/07/21
10/04/21
04/02/22
09/29/22
03/28/23
09/24/23
03/22/24
09/18/24
03/17/25
Flow (cfs)
Rainfall

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
7/1/2024	88.64	88.64	88.64	88.64	18.8
7/2/2024	88.51	88.51	88.51	88.51	17.0
7/3/2024	88.88	88.88	88.88	88.88	22.1
7/4/2024	88.79	88.79	88.79	88.79	21.0
7/5/2024	88.84	88.84	88.84	88.84	21.6
7/6/2024	88.82	88.82	88.82	88.82	21.4
7/7/2024	88.52	88.52	88.52	88.52	17.1
7/8/2024	88.50	88.50	88.50	88.50	16.9
7/9/2024	88.51	88.51	88.51	88.51	17.1
7/10/2024	88.51	88.51	88.51	88.51	17.0
7/11/2024	88.49	88.49	88.49	88.49	16.7
7/12/2024	88.50	88.50	88.50	88.50	16.8
7/13/2024	88.47	88.47	88.47	88.47	16.5
7/14/2024	89.16	89.16	89.16	89.16	26.1
7/15/2024	89.16	89.16	89.16	89.16	26.1
7/16/2024	89.01	89.01	89.01	89.01	24.0
7/17/2024	88.94	88.94	88.94	88.94	23.0
7/18/2024	89.65	89.65	89.65	89.65	33.1
7/19/2024	89.76	89.76	89.76	89.76	34.6
7/20/2024	89.48	89.48	89.48	89.48	30.6
7/21/2024	89.16	89.16	89.16	89.16	26.1
7/22/2024	89.01	89.01	89.01	89.01	24.0
7/23/2024	89.54	89.54	89.54	89.54	31.4
7/24/2024	89.44	89.44	89.44	89.44	30.1
7/25/2024	89.33	89.33	89.33	89.33	28.5
7/26/2024	89.15	89.15	89.15	89.15	26.0
7/27/2024	88.99	88.99	88.99	88.99	23.8
7/28/2024	88.86	88.86	88.86	88.86	21.8
7/29/2024	88.78	88.78	88.78	88.78	20.8
7/30/2024	89.09	89.09	89.09	89.09	25.1
7/31/2024	89.09	89.09	89.09	89.09	25.2

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
8/1/2024	89.07	89.07	89.07	89.07	24.9
8/2/2024	89.19	89.19	89.19	89.19	26.5
8/3/2024	89.19	89.19	89.19	89.19	26.5
8/4/2024	90.53	90.53	90.53	90.53	45.6
8/5/2024	94.58	94.58	94.58	94.58	107.1
8/6/2024	92.44	92.44	92.44	92.44	74.0
8/7/2024	91.23	91.23	91.23	91.23	56.0
8/8/2024	90.81	90.81	90.81	90.81	49.8
8/9/2024	90.32	90.32	90.32	90.32	42.7
8/10/2024	90.17	90.17	90.17	90.17	40.5
8/11/2024	89.99	89.99	89.99	89.99	37.9
8/12/2024	91.20	91.20	91.20	91.20	55.5
8/13/2024	91.04	91.04	91.04	91.04	53.1
8/14/2024	90.48	90.48	90.48	90.48	45.0
8/15/2024	90.10	90.10	90.10	90.10	39.5
8/16/2024	89.89	89.89	89.89	89.89	36.6
8/17/2024	89.73	89.73	89.73	89.73	34.3
8/18/2024	89.62	89.62	89.62	89.62	32.6
8/19/2024	89.52	89.52	89.52	89.52	31.2
8/20/2024	89.50	89.50	89.50	89.50	31.0
8/21/2024	90.56	90.56	90.56	90.56	46.1
8/22/2024	90.42	90.42	90.42	90.42	44.1
8/23/2024	90.24	90.24	90.24	90.24	41.6
8/24/2024	90.31	90.31	90.31	90.31	42.5
8/25/2024	90.05	90.05	90.05	90.05	38.8
8/26/2024	89.76	89.76	89.76	89.76	34.7
8/27/2024	89.65	89.65	89.65	89.65	33.1
8/28/2024	89.56	89.56	89.56	89.56	31.7
8/29/2024	89.53	89.53	89.53	89.53	31.3
8/30/2024	89.42	89.42	89.42	89.42	29.8
8/31/2024	89.38	89.38	89.38	89.38	29.2

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
9/1/2024	89.30	89.30	89.30	89.30	28.1
9/2/2024	89.59	89.59	89.59	89.59	32.2
9/3/2024	90.64	90.64	90.64	90.64	47.4
9/4/2024	91.09	91.09	91.09	91.09	53.9
9/5/2024	91.03	91.03	91.03	91.03	53.1
9/6/2024	90.82	90.82	90.82	90.82	50.0
9/7/2024	90.45	90.45	90.45	90.45	44.6
9/8/2024	90.01	90.01	90.01	90.01	38.3
9/9/2024	89.76	89.76	89.76	89.76	34.6
9/10/2024	89.63	89.63	89.63	89.63	32.7
9/11/2024	89.53	89.53	89.53	89.53	31.3
9/12/2024	89.55	89.55	89.55	89.55	31.7
9/13/2024	89.53	89.53	89.53	89.53	31.3
9/14/2024	89.36	89.36	89.36	89.36	28.9
9/15/2024	89.29	89.29	89.29	89.29	27.9
9/16/2024	89.24	89.24	89.24	89.24	27.2
9/17/2024	89.19	89.19	89.19	89.19	26.5
9/18/2024	89.15	89.15	89.15	89.15	26.0
9/19/2024	89.13	89.13	89.13	89.13	25.7
9/20/2024	89.08	89.08	89.08	89.08	25.0
9/21/2024	89.05	89.05	89.05	89.05	24.5
9/22/2024	89.00	89.00	89.00	89.00	23.9
9/23/2024	88.99	88.99	88.99	88.99	23.7
9/24/2024	88.94	88.94	88.94	88.94	23.0
9/25/2024	89.16	89.16	89.16	89.16	26.1
9/26/2024	90.44	90.44	90.44	90.44	44.5
9/27/2024	90.62	90.62	90.62	90.62	47.0
9/28/2024	90.24	90.24	90.24	90.24	41.5
9/29/2024	89.77	89.77	89.77	89.77	34.8
9/30/2024	89.53	89.53	89.53	89.53	31.3

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
10/1/2024	89.74	89.74	89.74	89.74	34.3
10/2/2024	89.75	89.75	89.75	89.75	34.4
10/3/2024	89.53	89.53	89.53	89.53	31.4
10/4/2024	89.38	89.38	89.38	89.38	29.3
10/5/2024	89.32	89.32	89.32	89.32	28.4
10/6/2024	88.91	88.91	88.91	88.91	22.6
10/7/2024	88.91	88.91	88.91	88.91	22.7
10/8/2024	88.90	88.90	88.90	88.90	22.4
10/9/2024	92.91	92.91	92.91	92.91	81.1
10/10/2024	93.03	93.03	93.03	93.03	83.0
10/11/2024	91.18	91.18	91.18	91.18	55.2
10/12/2024	90.53	90.53	90.53	90.53	45.6
10/13/2024	90.24	90.24	90.24	90.24	41.6
10/14/2024	89.81	89.81	89.81	89.81	35.4
10/15/2024	89.58	89.58	89.58	89.58	32.0
10/16/2024	89.43	89.43	89.43	89.43	29.9
10/17/2024	89.31	89.31	89.31	89.31	28.2
10/18/2024	89.22	89.22	89.22	89.22	27.0
10/19/2024	89.17	89.17	89.17	89.17	26.2
10/20/2024	89.13	89.13	89.13	89.13	25.7
10/21/2024	89.11	89.11	89.11	89.11	25.4
10/22/2024	89.06	89.06	89.06	89.06	24.7
10/23/2024	89.04	89.04	89.04	89.04	24.5
10/24/2024	88.99	88.99	88.99	88.99	23.7
10/25/2024	88.97	88.97	88.97	88.97	23.5
10/26/2024	89.07	89.07	89.07	89.07	24.9
10/27/2024	89.15	89.15	89.15	89.15	25.9
10/28/2024	89.24	89.24	89.24	89.24	27.3
10/29/2024	89.26	89.26	89.26	89.26	27.5
10/30/2024	89.21	89.21	89.21	89.21	26.8
10/31/2024	89.18	89.18	89.18	89.18	26.4

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
11/1/2024	89.02	89.02	89.02	89.02	24.1
11/2/2024	89.08	89.08	89.08	89.08	25.0
11/3/2024	89.01	89.01	89.01	89.01	24.0
11/4/2024	88.93	88.93	88.93	88.93	22.9
11/5/2024	88.86	88.86	88.86	88.86	21.9
11/6/2024	88.86	88.86	88.86	88.86	21.9
11/7/2024	88.82	88.82	88.82	88.82	21.4
11/8/2024	88.79	88.79	88.79	88.79	20.9
11/9/2024	88.76	88.76	88.76	88.76	20.6
11/10/2024	88.76	88.76	88.76	88.76	20.5
11/11/2024	88.74	88.74	88.74	88.74	20.3
11/12/2024	88.73	88.73	88.73	88.73	20.1
11/13/2024	88.70	88.70	88.70	88.70	19.7
11/14/2024	88.69	88.69	88.69	88.69	19.5
11/15/2024	88.67	88.67	88.67	88.67	19.3
11/16/2024	88.65	88.65	88.65	88.65	18.9
11/17/2024	88.65	88.65	88.65	88.65	19.0
11/18/2024	88.65	88.65	88.65	88.65	18.9
11/19/2024	88.63	88.63	88.63	88.63	18.7
11/20/2024	88.73	88.73	88.73	88.73	20.1
11/21/2024	88.68	88.68	88.68	88.68	19.3
11/22/2024	88.63	88.63	88.63	88.63	18.7
11/23/2024	88.63	88.63	88.63	88.63	18.6
11/24/2024	88.62	88.62	88.62	88.62	18.5
11/25/2024	88.62	88.62	88.62	88.62	18.6
11/26/2024	88.62	88.62	88.62	88.62	18.6
11/27/2024	88.61	88.61	88.61	88.61	18.4
11/28/2024	88.62	88.62	88.62	88.62	18.5
11/29/2024	88.62	88.62	88.62	88.62	18.6
11/30/2024	88.60	88.60	88.60	88.60	18.3

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
12/1/2024	88.59	88.59	88.59	88.59	18.1
12/2/2024	88.58	88.58	88.58	88.58	18.0
12/3/2024	88.58	88.58	88.58	88.58	17.9
12/4/2024	88.58	88.58	88.58	88.58	18.0
12/5/2024	88.59	88.59	88.59	88.59	18.2
12/6/2024	88.60	88.60	88.60	88.60	18.3
12/7/2024	88.59	88.59	88.59	88.59	18.2
12/8/2024	88.59	88.59	88.59	88.59	18.2
12/9/2024	88.60	88.60	88.60	88.60	18.3
12/10/2024	88.60	88.60	88.60	88.60	18.3
12/11/2024	88.92	88.92	88.92	88.92	22.7
12/12/2024	88.73	88.73	88.73	88.73	20.1
12/13/2024	88.64	88.64	88.64	88.64	18.8
12/14/2024	88.66	88.66	88.66	88.66	19.1
12/15/2024	88.67	88.67	88.67	88.67	19.2
12/16/2024	88.67	88.67	88.67	88.67	19.2
12/17/2024	88.68	88.68	88.68	88.68	19.3
12/18/2024	88.67	88.67	88.67	88.67	19.3
12/19/2024	88.67	88.67	88.67	88.67	19.2
12/20/2024	88.65	88.65	88.65	88.65	19.0
12/21/2024	88.63	88.63	88.63	88.63	18.6
12/22/2024	88.63	88.63	88.63	88.63	18.6
12/23/2024	88.64	88.64	88.64	88.64	18.8
12/24/2024	88.64	88.64	88.64	88.64	18.8
12/25/2024	88.64	88.64	88.64	88.64	18.9
12/26/2024	88.65	88.65	88.65	88.65	18.9
12/27/2024	88.64	88.64	88.64	88.64	18.9
12/28/2024	88.64	88.64	88.64	88.64	18.8
12/29/2024	88.83	88.83	88.83	88.83	21.4
12/30/2024	88.80	88.80	88.80	88.80	21.1
12/31/2024	88.70	88.70	88.70	88.70	19.6

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
1/1/2025	88.68	88.68	88.68	88.68	19.4
1/2/2025	88.64	88.64	88.64	88.64	18.8
1/3/2025	88.62	88.62	88.62	88.62	18.5
1/4/2025	88.62	88.62	88.62	88.62	18.5
1/5/2025	88.61	88.61	88.61	88.61	18.3
1/6/2025	88.63	88.63	88.63	88.63	18.6
1/7/2025	88.61	88.61	88.61	88.61	18.3
1/8/2025	88.58	88.58	88.58	88.58	18.0
1/9/2025	88.58	88.58	88.58	88.58	17.9
1/10/2025	88.61	88.61	88.61	88.61	18.4
1/11/2025	88.63	88.63	88.63	88.63	18.7
1/12/2025	88.61	88.61	88.61	88.61	18.5
1/13/2025	88.65	88.65	88.65	88.65	19.0
1/14/2025	88.66	88.66	88.66	88.66	19.1
1/15/2025	88.61	88.61	88.61	88.61	18.5
1/16/2025	88.60	88.60	88.60	88.60	18.3
1/17/2025	88.60	88.60	88.60	88.60	18.3
1/18/2025	88.61	88.61	88.61	88.61	18.3
1/19/2025	88.70	88.70	88.70	88.70	19.6
1/20/2025	88.65	88.65	88.65	88.65	19.0
1/21/2025	89.20	89.20	89.20	89.20	26.7
1/22/2025	89.19	89.19	89.19	89.19	26.6
1/23/2025	89.03	89.03	89.03	89.03	24.3
1/24/2025	89.03	89.03	89.03	89.03	24.2
1/25/2025	88.92	88.92	88.92	88.92	22.8
1/26/2025	88.88	88.88	88.88	88.88	22.2
1/27/2025	88.84	88.84	88.84	88.84	21.6
1/28/2025	88.81	88.81	88.81	88.81	21.2
1/29/2025	88.80	88.80	88.80	88.80	21.1
1/30/2025	88.78	88.78	88.78	88.78	20.8
1/31/2025	88.76	88.76	88.76	88.76	20.5

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
2/1/2025	88.75	88.75	88.75	88.75	20.4
2/2/2025	88.74	88.74	88.74	88.74	20.2
2/3/2025	88.74	88.74	88.74	88.74	20.2
2/4/2025	88.72	88.72	88.72	88.72	20.0
2/5/2025	88.71	88.71	88.71	88.71	19.8
2/6/2025	88.70	88.70	88.70	88.70	19.7
2/7/2025	88.69	88.69	88.69	88.69	19.6
2/8/2025	88.68	88.68	88.68	88.68	19.4
2/9/2025	88.67	88.67	88.67	88.67	19.3
2/10/2025	88.67	88.67	88.67	88.67	19.3
2/11/2025	88.66	88.66	88.66	88.66	19.1
2/12/2025	88.67	88.67	88.67	88.67	19.2
2/13/2025	88.66	88.66	88.66	88.66	19.1
2/14/2025	88.64	88.64	88.64	88.64	18.8
2/15/2025	88.62	88.62	88.62	88.62	18.6
2/16/2025	88.63	88.63	88.63	88.63	18.7
2/17/2025	88.62	88.62	88.62	88.62	18.5
2/18/2025	88.60	88.60	88.60	88.60	18.3
2/19/2025	88.75	88.75	88.75	88.75	20.4
2/20/2025	88.74	88.74	88.74	88.74	20.3
2/21/2025	88.61	88.61	88.61	88.61	18.5
2/22/2025	88.61	88.61	88.61	88.61	18.5
2/23/2025	88.62	88.62	88.62	88.62	18.6
2/24/2025	89.72	89.72	89.72	89.72	34.0
2/25/2025	89.74	89.74	89.74	89.74	34.3
2/26/2025	89.33	89.33	89.33	89.33	28.6
2/27/2025	89.18	89.18	89.18	89.18	26.4
2/28/2025	89.08	89.08	89.08	89.08	24.9

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
3/1/2025	88.99	88.99	88.99	88.99	23.7
3/2/2025	88.93	88.93	88.93	88.93	22.9
3/3/2025	88.87	88.87	88.87	88.87	22.0
3/4/2025	88.83	88.83	88.83	88.83	21.5
3/5/2025	88.92	88.92	88.92	88.92	22.7
3/6/2025	88.91	88.91	88.91	88.91	22.5
3/7/2025	88.86	88.86	88.86	88.86	22.0
3/8/2025	88.80	88.80	88.80	88.80	21.1
3/9/2025	88.79	88.79	88.79	88.79	21.0
3/10/2025	88.82	88.82	88.82	88.82	21.4
3/11/2025	88.77	88.77	88.77	88.77	20.6
3/12/2025	88.73	88.73	88.73	88.73	20.1
3/13/2025	88.72	88.72	88.72	88.72	20.0
3/14/2025	88.72	88.72	88.72	88.72	20.0
3/15/2025	88.72	88.72	88.72	88.72	20.0
3/16/2025	88.71	88.71	88.71	88.71	19.8
3/17/2025	88.70	88.70	88.70	88.70	19.7
3/18/2025	88.66	88.66	88.66	88.66	19.2
3/19/2025	88.65	88.65	88.65	88.65	19.0
3/20/2025	88.65	88.65	88.65	88.65	18.9
3/21/2025	88.63	88.63	88.63	88.63	18.7
3/22/2025	88.64	88.64	88.64	88.64	18.8
3/23/2025	88.64	88.64	88.64	88.64	18.8
3/24/2025	88.65	88.65	88.65	88.65	18.9
3/25/2025	88.65	88.65	88.65	88.65	19.0
3/26/2025	88.62	88.62	88.62	88.62	18.6
3/27/2025	88.61	88.61	88.61	88.61	18.4
3/28/2025	88.60	88.60	88.60	88.60	18.3
3/29/2025	88.60	88.60	88.60	88.60	18.3
3/30/2025	88.63	88.63	88.63	88.63	18.7
3/31/2025	88.62	88.62	88.62	88.62	18.6

PR #6 Pierce Branch at Owens Rd Data

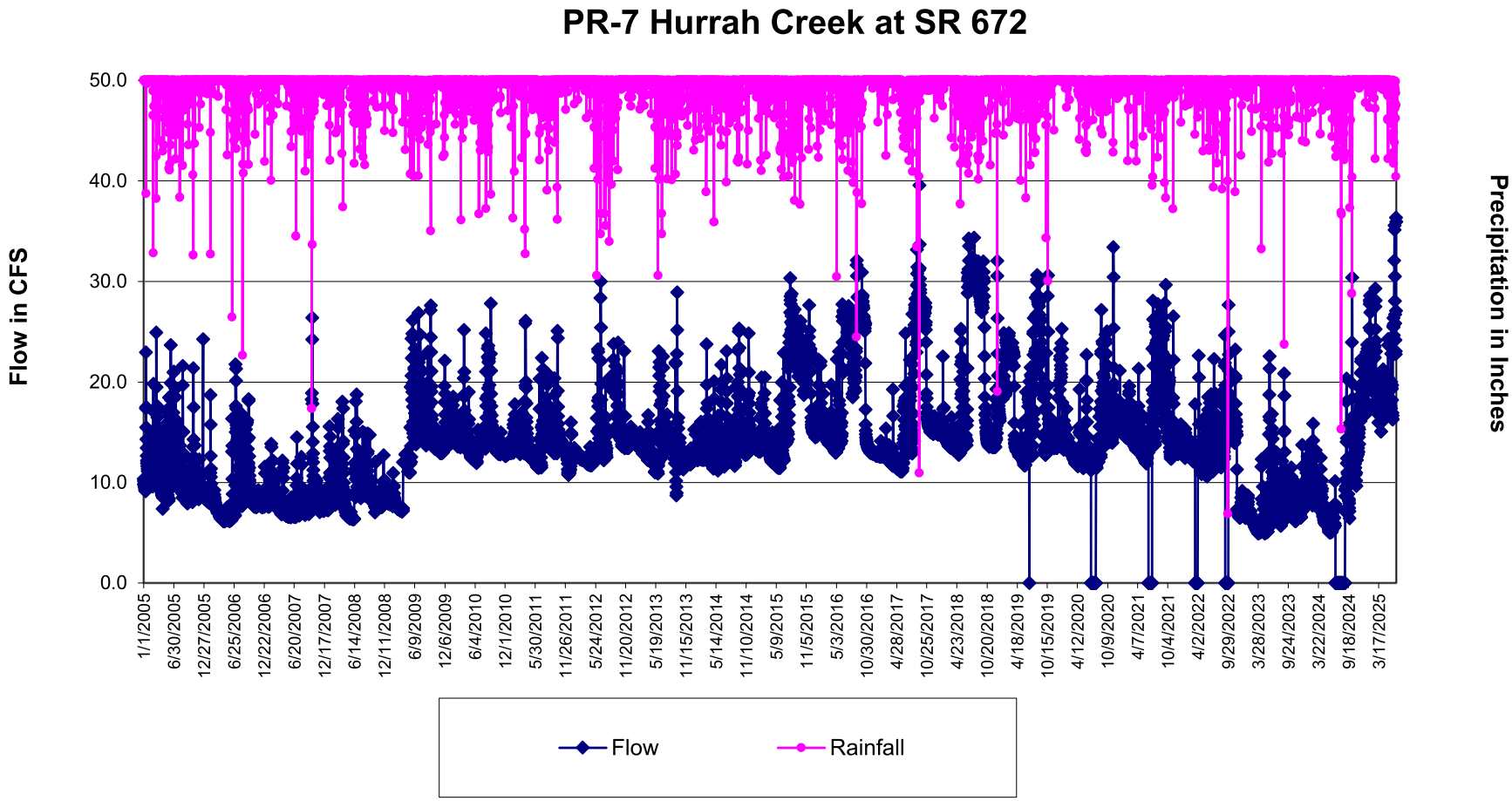
Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
4/1/2025	88.61	88.61	88.61	88.61	18.4
4/2/2025	88.59	88.59	88.59	88.59	18.1
4/3/2025	89.02	89.02	89.02	89.02	24.1
4/4/2025	89.34	89.34	89.34	89.34	28.6
4/5/2025	89.11	89.11	89.11	89.11	25.4
4/6/2025	88.54	88.54	88.54	88.54	17.4
4/7/2025	89.33	89.33	89.33	89.33	28.5
4/8/2025	88.66	88.66	88.66	88.66	19.2
4/9/2025	88.58	88.58	88.58	88.58	18.0
4/10/2025	88.53	88.53	88.53	88.53	17.3
4/11/2025	88.53	88.53	88.53	88.53	17.2
4/12/2025	88.78	88.78	88.78	88.78	20.8
4/13/2025	88.57	88.57	88.57	88.57	17.9
4/14/2025	88.53	88.53	88.53	88.53	17.3
4/15/2025	88.52	88.52	88.52	88.52	17.1
4/16/2025	88.51	88.51	88.51	88.51	17.1
4/17/2025	88.52	88.52	88.52	88.52	17.1
4/18/2025	88.50	88.50	88.50	88.50	16.8
4/19/2025	88.49	88.49	88.49	88.49	16.7
4/20/2025	88.47	88.47	88.47	88.47	16.5
4/21/2025	88.47	88.47	88.47	88.47	16.5
4/22/2025	88.47	88.47	88.47	88.47	16.5
4/23/2025	88.47	88.47	88.47	88.47	16.4
4/24/2025	88.46	88.46	88.46	88.46	16.3
4/25/2025	88.46	88.46	88.46	88.46	16.3
4/26/2025	88.43	88.43	88.43	88.43	16.0
4/27/2025	88.46	88.46	88.46	88.46	16.3
4/28/2025	88.45	88.45	88.45	88.45	16.2
4/29/2025	88.44	88.44	88.44	88.44	16.1
4/30/2025	88.43	88.43	88.43	88.43	15.9

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
5/1/2025	88.43	88.43	88.43	88.43	15.9
5/2/2025	88.44	88.44	88.44	88.44	16.1
5/3/2025	88.44	88.44	88.44	88.44	16.0
5/4/2025	88.46	88.46	88.46	88.46	16.3
5/5/2025	88.46	88.46	88.46	88.46	16.3
5/6/2025	88.45	88.45	88.45	88.45	16.2
5/7/2025	88.45	88.45	88.45	88.45	16.1
5/8/2025	88.45	88.45	88.45	88.45	16.2
5/9/2025	88.52	88.52	88.52	88.52	17.2
5/10/2025	89.39	89.39	89.39	89.39	29.3
5/11/2025	89.34	89.34	89.34	89.34	28.6
5/12/2025	89.49	89.49	89.49	89.49	30.8
5/13/2025	89.07	89.07	89.07	89.07	24.9
5/14/2025	88.72	88.72	88.72	88.72	20.0
5/15/2025	88.66	88.66	88.66	88.66	19.1
5/16/2025	88.63	88.63	88.63	88.63	18.6
5/17/2025	88.60	88.60	88.60	88.60	18.3
5/18/2025	88.59	88.59	88.59	88.59	18.1
5/19/2025	88.57	88.57	88.57	88.57	17.8
5/20/2025	88.55	88.55	88.55	88.55	17.6
5/21/2025	88.54	88.54	88.54	88.54	17.4
5/22/2025	88.54	88.54	88.54	88.54	17.4
5/23/2025	88.52	88.52	88.52	88.52	17.2
5/24/2025	88.50	88.50	88.50	88.50	16.8
5/25/2025	88.48	88.48	88.48	88.48	16.6
5/26/2025	88.48	88.48	88.48	88.48	16.7
5/27/2025	88.49	88.49	88.49	88.49	16.7
5/28/2025	88.51	88.51	88.51	88.51	17.1
5/29/2025	88.49	88.49	88.49	88.49	16.7
5/30/2025	88.54	88.54	88.54	88.54	17.5
5/31/2025	89.24	89.24	89.24	89.24	27.2

PR #6 Pierce Branch at Owens Rd Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
6/1/2025	88.85	88.85	88.85	88.85	21.8
6/2/2025	88.68	88.68	88.68	88.68	19.4
6/3/2025	88.68	88.68	88.68	88.68	19.3
6/4/2025	89.11	89.11	89.11	89.11	25.5
6/5/2025	89.03	89.03	89.03	89.03	24.3
6/6/2025	88.74	88.74	88.74	88.74	20.2
6/7/2025	88.65	88.65	88.65	88.65	18.9
6/8/2025	88.60	88.60	88.60	88.60	18.2
6/9/2025	88.57	88.57	88.57	88.57	17.9
6/10/2025	88.80	88.80	88.80	88.80	21.1
6/11/2025	88.84	88.84	88.84	88.84	21.6
6/12/2025	88.91	88.91	88.91	88.91	22.6
6/13/2025	90.37	90.37	90.37	90.37	43.4
6/14/2025	90.48	90.48	90.48	90.48	45.0
6/15/2025	89.97	89.97	89.97	89.97	37.6
6/16/2025	90.20	90.20	90.20	90.20	41.0
6/17/2025	89.88	89.88	89.88	89.88	36.3
6/18/2025	90.60	90.60	90.60	90.60	46.8
6/19/2025	90.56	90.56	90.56	90.56	46.1
6/20/2025	90.47	90.47	90.47	90.47	44.9
6/21/2025	90.10	90.10	90.10	90.10	39.5
6/22/2025	89.71	89.71	89.71	89.71	33.9
6/23/2025	89.57	89.57	89.57	89.57	31.9
6/24/2025	89.38	89.38	89.38	89.38	29.2
6/25/2025	89.23	89.23	89.23	89.23	27.1
6/26/2025	89.14	89.14	89.14	89.14	25.8
6/27/2025	89.30	89.30	89.30	89.30	28.1
6/28/2025	89.36	89.36	89.36	89.36	29.0
6/29/2025	91.10	91.10	91.10	91.10	54.1
6/30/2025	90.90	90.90	90.90	90.90	51.1


PR-7 Hurrah Creek at SR 672
Flow in CFS
Precipitation in Inches
50.0
40.0
30.0
20.0
10.0
0.0
1/1/2005
6/30/2005
12/27/2005
6/25/2006
12/22/2006
6/20/2007
12/17/2007
6/14/2008
12/11/2008
6/9/2009
12/6/2009
6/4/2010
12/1/2010
5/30/2011
11/26/2011
5/24/2012
11/20/2012
5/19/2013
11/15/2013
5/14/2014
11/10/2014
5/9/2015
11/5/2015
5/3/2016
10/30/2016
4/28/2017
10/25/2017
4/23/2018
10/20/2018
4/18/2019
10/15/2019
4/12/2020
10/9/2020
4/7/2021
10/4/2021
4/2/2022
9/29/2022
3/28/2023
9/24/2023
3/22/2024
9/18/2024
3/17/2025
Flow
Rainfall

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
7/1/2024	63.23	63.23	63.23	63.23	10.1
7/2/2024	62.70	62.70	62.70	62.70	7.7
7/3/2024	0.00	0.00	0.00		0.0
7/4/2024	0.00	0.00	0.00		0.0
7/5/2024	0.00	0.00	0.00		0.0
7/6/2024	0.00	0.00	0.00		0.0
7/7/2024	0.00	0.00	0.00		0.0
7/8/2024	0.00	0.00	0.00		0.0
7/9/2024	0.00	0.00	0.00		0.0
7/10/2024	0.00	0.00	0.00		0.0
7/11/2024	0.00	0.00	0.00		0.0
7/12/2024	0.00	0.00	0.00		0.0
7/13/2024	0.00	0.00	0.00		0.0
7/14/2024	0.00	0.00	0.00		0.0
7/15/2024	0.00	0.00	0.00		0.0
7/16/2024	0.00	0.00	0.00		0.0
7/17/2024	0.00	0.00	0.00		0.0
7/18/2024	0.00	0.00	0.00		0.0
7/19/2024	0.00	0.00	0.00		0.0
7/20/2024	0.00	0.00	0.00		0.0
7/21/2024	0.00	0.00	0.00		0.0
7/22/2024	0.00	0.00	0.00		0.0
7/23/2024	0.00	0.00	0.00		0.0
7/24/2024	0.00	0.00	0.00		0.0
7/25/2024	0.00	0.00	0.00		0.0
7/26/2024	0.00	0.00	0.00		0.0
7/27/2024	0.00	0.00	0.00		0.0
7/28/2024	0.00	0.00	0.00		0.0
7/29/2024	0.00	0.00	0.00		0.0
7/30/2024	0.00	0.00	0.00		0.0
7/31/2024	0.00	0.00	0.00		0.0

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
8/1/2024	0.00	0.00	0.00		0.0
8/2/2024	0.00	0.00	0.00		0.0
8/3/2024	0.00	0.00	0.00		0.0
8/4/2024	0.00	0.00	0.00		0.0
8/5/2024	0.00	0.00	0.00		0.0
8/6/2024	0.00	0.00	0.00		0.0
8/7/2024	0.00	0.00	0.00		0.0
8/8/2024	0.00	0.00	0.00		0.0
8/9/2024	0.00	0.00	0.00		0.0
8/10/2024	0.00	0.00	0.00		0.0
8/11/2024	0.00	0.00	0.00		0.0
8/12/2024	0.00	0.00	0.00		0.0
8/13/2024	0.00	0.00	0.00		0.0
8/14/2024	0.00	0.00	0.00		0.0
8/15/2024	0.00	0.00	0.00		0.0
8/16/2024	0.00	0.00	0.00		0.0
8/17/2024	0.00	0.00	0.00		0.0
8/18/2024	0.00	0.00	0.00		0.0
8/19/2024	0.00	0.00	0.00		0.0
8/20/2024	0.00	0.00	0.00		0.0
8/21/2024	0.00	0.00	0.00		0.0
8/22/2024	0.00	0.00	0.00		0.0
8/23/2024	0.00	0.00	0.00		0.0
8/24/2024	0.00	0.00	0.00		0.0
8/25/2024	0.00	0.00	0.00		0.0
8/26/2024	0.00	0.00	0.00		0.0
8/27/2024	0.00	0.00	0.00		0.0
8/28/2024	0.00	0.00	0.00		0.0
8/29/2024	63.05	63.05	63.05	63.05	9.3
8/30/2024	62.90	62.90	62.90	62.90	8.6
8/31/2024	63.06	63.06	63.06	63.06	9.4

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
9/1/2024	62.61	62.61	62.61	62.61	7.3
9/2/2024	62.54	62.54	62.54	62.54	7.0
9/3/2024	63.12	63.12	63.12	63.12	9.6
9/4/2024	63.28	63.28	63.28	63.28	10.3
9/5/2024	64.95	64.95	64.95	64.95	18.0
9/6/2024	65.43	65.43	65.43	65.43	20.3
9/7/2024	64.09	64.09	64.09	64.09	14.0
9/8/2024	63.63	63.63	63.63	63.63	11.9
9/9/2024	64.17	64.17	64.17	64.17	14.4
9/10/2024	64.38	64.38	64.38	64.38	15.4
9/11/2024	63.74	63.74	63.74	63.74	12.4
9/12/2024	63.43	63.43	63.43	63.43	11.0
9/13/2024	63.39	63.39	63.39	63.39	10.9
9/14/2024	63.25	63.25	63.25	63.25	10.2
9/15/2024	63.20	63.20	63.20	63.20	10.0
9/16/2024	63.13	63.13	63.13	63.13	9.7
9/17/2024	63.16	63.16	63.16	63.16	9.8
9/18/2024	62.94	62.94	62.94	62.94	8.8
9/19/2024	62.85	62.85	62.85	62.85	8.4
9/20/2024	62.80	62.80	62.80	62.80	8.2
9/21/2024	62.83	62.83	62.83	62.83	8.3
9/22/2024	62.74	62.74	62.74	62.74	7.9
9/23/2024	62.64	62.64	62.64	62.64	7.5
9/24/2024	62.56	62.56	62.56	62.56	7.1
9/25/2024	62.41	62.41	62.41	62.41	6.4
9/26/2024	63.38	63.38	63.38	63.38	10.8
9/27/2024	64.50	64.50	64.50	64.50	15.9
9/28/2024	64.50	64.50	64.50	64.50	15.9
9/29/2024	64.08	64.08	64.08	64.08	14.0
9/30/2024	63.75	63.75	63.75	63.75	12.5

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
10/1/2024	63.76	63.76	63.76	63.76	12.5
10/2/2024	63.63	63.63	63.63	63.63	11.9
10/3/2024	63.63	63.63	63.63	63.63	11.9
10/4/2024	63.61	63.61	63.61	63.61	11.9
10/5/2024	63.52	63.52	63.52	63.52	11.4
10/6/2024	63.55	63.55	63.55	63.55	11.6
10/7/2024	63.69	63.69	63.69	63.69	12.2
10/8/2024	63.61	63.61	63.61	63.61	11.8
10/9/2024	66.17	66.17	66.17	66.17	23.9
10/10/2024	67.46	67.46	67.46	67.46	30.4
10/11/2024	65.32	65.32	65.32	65.32	19.8
10/12/2024	65.01	65.01	65.01	65.01	18.4
10/13/2024	64.63	64.63	64.63	64.63	16.6
10/14/2024	64.29	64.29	64.29	64.29	15.0
10/15/2024	64.15	64.15	64.15	64.15	14.3
10/16/2024	64.02	64.02	64.02	64.02	13.7
10/17/2024	64.42	64.42	64.42	64.42	15.6
10/18/2024	64.34	64.34	64.34	64.34	15.2
10/19/2024	64.03	64.03	64.03	64.03	13.8
10/20/2024	63.85	63.85	63.85	63.85	12.9
10/21/2024	63.61	63.61	63.61	63.61	11.8
10/22/2024	63.44	63.44	63.44	63.44	11.1
10/23/2024	63.42	63.42	63.42	63.42	11.0
10/24/2024	63.45	63.45	63.45	63.45	11.1
10/25/2024	63.64	63.64	63.64	63.64	12.0
10/26/2024	63.67	63.67	63.67	63.67	12.1
10/27/2024	63.68	63.68	63.68	63.68	12.2
10/28/2024	63.61	63.61	63.61	63.61	11.9
10/29/2024	63.52	63.52	63.52	63.52	11.4
10/30/2024	63.43	63.43	63.43	63.43	11.0
10/31/2024	63.38	63.38	63.38	63.38	10.8

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
11/1/2024	63.42	63.42	63.42	63.42	11.0
11/2/2024	63.25	63.25	63.25	63.25	10.2
11/3/2024	63.13	63.13	63.13	63.13	9.7
11/4/2024	64.04	64.04	64.04	64.04	13.8
11/5/2024	63.96	63.96	63.96	63.96	13.4
11/6/2024	63.78	63.78	63.78	63.78	12.6
11/7/2024	63.70	63.70	63.70	63.70	12.2
11/8/2024	63.79	63.79	63.79	63.79	12.7
11/9/2024	63.87	63.87	63.87	63.87	13.0
11/10/2024	63.95	63.95	63.95	63.95	13.4
11/11/2024	63.84	63.84	63.84	63.84	12.9
11/12/2024	63.82	63.82	63.82	63.82	12.8
11/13/2024	63.86	63.86	63.86	63.86	13.0
11/14/2024	63.96	63.96	63.96	63.96	13.4
11/15/2024	63.88	63.88	63.88	63.88	13.1
11/16/2024	64.30	64.30	64.30	64.30	15.0
11/17/2024	64.40	64.40	64.40	64.40	15.5
11/18/2024	64.27	64.27	64.27	64.27	14.9
11/19/2024	64.19	64.19	64.19	64.19	14.5
11/20/2024	64.04	64.04	64.04	64.04	13.8
11/21/2024	64.36	64.36	64.36	64.36	15.3
11/22/2024	64.80	64.80	64.80	64.80	17.3
11/23/2024	65.04	65.04	65.04	65.04	18.5
11/24/2024	65.26	65.26	65.26	65.26	19.5
11/25/2024	65.26	65.26	65.26	65.26	19.5
11/26/2024	65.08	65.08	65.08	65.08	18.7
11/27/2024	64.87	64.87	64.87	64.87	17.7
11/28/2024	64.77	64.77	64.77	64.77	17.2
11/29/2024	64.54	64.54	64.54	64.54	16.1
11/30/2024	64.95	64.95	64.95	64.95	18.1

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
12/1/2024	65.21	65.21	65.21	65.21	19.3
12/2/2024	65.54	65.54	65.54	65.54	20.9
12/3/2024	65.78	65.78	65.78	65.78	22.0
12/4/2024	65.83	65.83	65.83	65.83	22.3
12/5/2024	65.55	65.55	65.55	65.55	21.0
12/6/2024	65.32	65.32	65.32	65.32	19.8
12/7/2024	65.56	65.56	65.56	65.56	21.0
12/8/2024	65.55	65.55	65.55	65.55	20.9
12/9/2024	65.27	65.27	65.27	65.27	19.6
12/10/2024	65.09	65.09	65.09	65.09	18.7
12/11/2024	65.21	65.21	65.21	65.21	19.3
12/12/2024	65.76	65.76	65.76	65.76	22.0
12/13/2024	65.80	65.80	65.80	65.80	22.2
12/14/2024	65.52	65.52	65.52	65.52	20.8
12/15/2024	65.20	65.20	65.20	65.20	19.2
12/16/2024	65.07	65.07	65.07	65.07	18.6
12/17/2024	64.87	64.87	64.87	64.87	17.7
12/18/2024	64.77	64.77	64.77	64.77	17.2
12/19/2024	64.69	64.69	64.69	64.69	16.8
12/20/2024	64.82	64.82	64.82	64.82	17.4
12/21/2024	65.31	65.31	65.31	65.31	19.8
12/22/2024	65.62	65.62	65.62	65.62	21.3
12/23/2024	65.51	65.51	65.51	65.51	20.7
12/24/2024	65.27	65.27	65.27	65.27	19.6
12/25/2024	65.19	65.19	65.19	65.19	19.2
12/26/2024	65.18	65.18	65.18	65.18	19.2
12/27/2024	64.93	64.93	64.93	64.93	18.0
12/28/2024	64.92	64.92	64.92	64.92	17.9
12/29/2024	64.68	64.68	64.68	64.68	16.8
12/30/2024	64.77	64.77	64.77	64.77	17.2
12/31/2024	64.69	64.69	64.69	64.69	16.8

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
1/1/2025	64.95	64.95	64.95	64.95	18.1
1/2/2025	65.47	65.47	65.47	65.47	20.5
1/3/2025	65.75	65.75	65.75	65.75	21.9
1/4/2025	65.92	65.92	65.92	65.92	22.7
1/5/2025	65.97	65.97	65.97	65.97	23.0
1/6/2025	65.53	65.53	65.53	65.53	20.8
1/7/2025	65.76	65.76	65.76	65.76	21.9
1/8/2025	65.97	65.97	65.97	65.97	23.0
1/9/2025	66.12	66.12	66.12	66.12	23.7
1/10/2025	66.04	66.04	66.04	66.04	23.3
1/11/2025	65.52	65.52	65.52	65.52	20.8
1/12/2025	65.87	65.87	65.87	65.87	22.5
1/13/2025	65.76	65.76	65.76	65.76	21.9
1/14/2025	65.72	65.72	65.72	65.72	21.7
1/15/2025	66.06	66.06	66.06	66.06	23.4
1/16/2025	66.04	66.04	66.04	66.04	23.3
1/17/2025	65.83	65.83	65.83	65.83	22.3
1/18/2025	65.39	65.39	65.39	65.39	20.2
1/19/2025	65.28	65.28	65.28	65.28	19.6
1/20/2025	65.78	65.78	65.78	65.78	22.0
1/21/2025	66.46	66.46	66.46	66.46	25.4
1/22/2025	67.02	67.02	67.02	67.02	28.1
1/23/2025	66.94	66.94	66.94	66.94	27.7
1/24/2025	66.98	66.98	66.98	66.98	28.0
1/25/2025	67.10	67.10	67.10	67.10	28.6
1/26/2025	66.77	66.77	66.77	66.77	26.9
1/27/2025	66.41	66.41	66.41	66.41	25.1
1/28/2025	66.16	66.16	66.16	66.16	23.9
1/29/2025	66.12	66.12	66.12	66.12	23.7
1/30/2025	66.06	66.06	66.06	66.06	23.4
1/31/2025	65.86	65.86	65.86	65.86	22.4

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
2/1/2025	65.52	65.52	65.52	65.52	20.8
2/2/2025	65.55	65.55	65.55	65.55	20.9
2/3/2025	65.47	65.47	65.47	65.47	20.5
2/4/2025	65.40	65.40	65.40	65.40	20.2
2/5/2025	65.39	65.39	65.39	65.39	20.2
2/6/2025	65.44	65.44	65.44	65.44	20.4
2/7/2025	65.47	65.47	65.47	65.47	20.5
2/8/2025	65.47	65.47	65.47	65.47	20.5
2/9/2025	65.54	65.54	65.54	65.54	20.9
2/10/2025	65.52	65.52	65.52	65.52	20.8
2/11/2025	65.30	65.30	65.30	65.30	19.7
2/12/2025	65.22	65.22	65.22	65.22	19.4
2/13/2025	65.14	65.14	65.14	65.14	19.0
2/14/2025	65.32	65.32	65.32	65.32	19.8
2/15/2025	65.17	65.17	65.17	65.17	19.1
2/16/2025	64.88	64.88	64.88	64.88	17.7
2/17/2025	65.37	65.37	65.37	65.37	20.1
2/18/2025	65.56	65.56	65.56	65.56	21.0
2/19/2025	65.15	65.15	65.15	65.15	19.0
2/20/2025	65.55	65.55	65.55	65.55	20.9
2/21/2025	66.10	66.10	66.10	66.10	23.6
2/22/2025	66.07	66.07	66.07	66.07	23.5
2/23/2025	65.86	65.86	65.86	65.86	22.4
2/24/2025	66.89	66.89	66.89	66.89	27.5
2/25/2025	67.24	67.24	67.24	67.24	29.3
2/26/2025	67.01	67.01	67.01	67.01	28.1
2/27/2025	66.44	66.44	66.44	66.44	25.3
2/28/2025	66.20	66.20	66.20	66.20	24.1

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
3/1/2025	65.98	65.98	65.98	65.98	23.0
3/2/2025	65.32	65.32	65.32	65.32	19.8
3/3/2025	65.47	65.47	65.47	65.47	20.6
3/4/2025	65.20	65.20	65.20	65.20	19.3
3/5/2025	64.72	64.72	64.72	64.72	17.0
3/6/2025	65.14	65.14	65.14	65.14	18.9
3/7/2025	65.51	65.51	65.51	65.51	20.7
3/8/2025	65.35	65.35	65.35	65.35	20.0
3/9/2025	65.00	65.00	65.00	65.00	18.3
3/10/2025	64.69	64.69	64.69	64.69	16.8
3/11/2025	65.15	65.15	65.15	65.15	19.0
3/12/2025	65.32	65.32	65.32	65.32	19.8
3/13/2025	65.20	65.20	65.20	65.20	19.3
3/14/2025	65.09	65.09	65.09	65.09	18.7
3/15/2025	64.80	64.80	64.80	64.80	17.4
3/16/2025	64.50	64.50	64.50	64.50	15.9
3/17/2025	64.86	64.86	64.86	64.86	17.6
3/18/2025	65.27	65.27	65.27	65.27	19.6
3/19/2025	65.25	65.25	65.25	65.25	19.5
3/20/2025	65.11	65.11	65.11	65.11	18.8
3/21/2025	65.25	65.25	65.25	65.25	19.5
3/22/2025	65.50	65.50	65.50	65.50	20.7
3/23/2025	65.34	65.34	65.34	65.34	19.9
3/24/2025	65.03	65.03	65.03	65.03	18.5
3/25/2025	64.78	64.78	64.78	64.78	17.3
3/26/2025	64.90	64.90	64.90	64.90	17.8
3/27/2025	64.98	64.98	64.98	64.98	18.2
3/28/2025	64.98	64.98	64.98	64.98	18.2
3/29/2025	64.81	64.81	64.81	64.81	17.4
3/30/2025	64.49	64.49	64.49	64.49	15.9
3/31/2025	64.32	64.32	64.32	64.32	15.1

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
4/1/2025	64.32	64.32	64.32	64.32	15.1
4/2/2025	64.82	64.82	64.82	64.82	17.4
4/3/2025	64.81	64.81	64.81	64.81	17.4
4/4/2025	64.87	64.87	64.87	64.87	17.7
4/5/2025	64.81	64.81	64.81	64.81	17.4
4/6/2025	64.70	64.70	64.70	64.70	16.9
4/7/2025	64.54	64.54	64.54	64.54	16.1
4/8/2025	64.92	64.92	64.92	64.92	17.9
4/9/2025	65.25	65.25	65.25	65.25	19.5
4/10/2025	65.34	65.34	65.34	65.34	19.9
4/11/2025	65.15	65.15	65.15	65.15	19.0
4/12/2025	65.41	65.41	65.41	65.41	20.3
4/13/2025	65.62	65.62	65.62	65.62	21.3
4/14/2025	65.60	65.60	65.60	65.60	21.2
4/15/2025	65.37	65.37	65.37	65.37	20.1
4/16/2025	65.26	65.26	65.26	65.26	19.6
4/17/2025	65.42	65.42	65.42	65.42	20.3
4/18/2025	65.42	65.42	65.42	65.42	20.3
4/19/2025	65.29	65.29	65.29	65.29	19.7
4/20/2025	65.24	65.24	65.24	65.24	19.5
4/21/2025	65.13	65.13	65.13	65.13	18.9
4/22/2025	65.04	65.04	65.04	65.04	18.5
4/23/2025	65.03	65.03	65.03	65.03	18.4
4/24/2025	64.96	64.96	64.96	64.96	18.1
4/25/2025	64.98	64.98	64.98	64.98	18.2
4/26/2025	64.95	64.95	64.95	64.95	18.1
4/27/2025	64.94	64.94	64.94	64.94	18.0
4/28/2025	64.97	64.97	64.97	64.97	18.2
4/29/2025	64.96	64.96	64.96	64.96	18.1
4/30/2025	65.00	65.00	65.00	65.00	18.3

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
5/1/2025	65.03	65.03	65.03	65.03	18.5
5/2/2025	65.04	65.04	65.04	65.04	18.5
5/3/2025	64.81	64.81	64.81	64.81	17.4
5/4/2025	64.80	64.80	64.80	64.80	17.4
5/5/2025	64.90	64.90	64.90	64.90	17.8
5/6/2025	64.93	64.93	64.93	64.93	18.0
5/7/2025	64.81	64.81	64.81	64.81	17.4
5/8/2025	64.68	64.68	64.68	64.68	16.8
5/9/2025	64.63	64.63	64.63	64.63	16.6
5/10/2025	65.23	65.23	65.23	65.23	19.4
5/11/2025	65.39	65.39	65.39	65.39	20.2
5/12/2025	66.24	66.24	66.24	66.24	24.3
5/13/2025	66.11	66.11	66.11	66.11	23.7
5/14/2025	65.43	65.43	65.43	65.43	20.4
5/15/2025	65.21	65.21	65.21	65.21	19.3
5/16/2025	65.01	65.01	65.01	65.01	18.4
5/17/2025	64.98	64.98	64.98	64.98	18.2
5/18/2025	64.86	64.86	64.86	64.86	17.6
5/19/2025	64.78	64.78	64.78	64.78	17.3
5/20/2025	64.67	64.67	64.67	64.67	16.7
5/21/2025	64.78	64.78	64.78	64.78	17.2
5/22/2025	64.70	64.70	64.70	64.70	16.9
5/23/2025	64.78	64.78	64.78	64.78	17.3
5/24/2025	64.84	64.84	64.84	64.84	17.5
5/25/2025	64.90	64.90	64.90	64.90	17.8
5/26/2025	64.87	64.87	64.87	64.87	17.7
5/27/2025	64.83	64.83	64.83	64.83	17.5
5/28/2025	64.81	64.81	64.81	64.81	17.4
5/29/2025	64.80	64.80	64.80	64.80	17.4
5/30/2025	64.68	64.68	64.68	64.68	16.8
5/31/2025	65.93	65.93	65.93	65.93	22.8

Location PR #7 Hurrah Creek Data

Date(mm/dd)	Elev by Shift(ft)			Ave Elev (ft)	Ave Flow(CFS)
6/1/2025	65.36	65.36	65.36	65.36	20.0
6/2/2025	65.21	65.21	65.21	65.21	19.3
6/3/2025	65.30	65.30	65.30	65.30	19.7
6/4/2025	65.22	65.22	65.22	65.22	19.4
6/5/2025	65.28	65.28	65.28	65.28	19.7
6/6/2025	64.98	64.98	64.98	64.98	18.2
6/7/2025	64.71	64.71	64.71	64.71	16.9
6/8/2025	64.59	64.59	64.59	64.59	16.4
6/9/2025	64.57	64.57	64.57	64.57	16.3
6/10/2025	64.65	64.65	64.65	64.65	16.6
6/11/2025	66.29	66.29	66.29	66.29	24.6
6/12/2025	66.50	66.50	66.50	66.50	25.6
6/13/2025	65.93	65.93	65.93	65.93	22.8
6/14/2025	66.47	66.47	66.47	66.47	25.4
6/15/2025	66.66	66.66	66.66	66.66	26.4
6/16/2025	66.54	66.54	66.54	66.54	25.8
6/17/2025	66.31	66.31	66.31	66.31	24.7
6/18/2025	67.79	67.79	67.79	67.79	32.1
6/19/2025	68.46	68.46	68.46	68.46	35.6
6/20/2025	68.38	68.38	68.38	68.38	35.1
6/21/2025	67.48	67.48	67.48	67.48	30.5
6/22/2025	66.99	66.99	66.99	66.99	28.0
6/23/2025	66.73	66.73	66.73	66.73	26.7
6/24/2025	66.56	66.56	66.56	66.56	25.9
6/25/2025	66.21	66.21	66.21	66.21	24.2
6/26/2025	65.99	65.99	65.99	65.99	23.1
6/27/2025	65.93	65.93	65.93	65.93	22.8
6/28/2025	66.81	66.81	66.81	66.81	27.1
6/29/2025	68.61	68.61	68.61	68.61	36.3
6/30/2025	68.53	68.53	68.53	68.53	35.9

WILDLIFE REPORTS

Twenty-Third Annual Florida Scrub-Jay Management Activity Report

USFWS Biological Opinion for Service Log No. 00-171a



January 2025

Mosaic

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1.0 INTRODUCTION

The U.S. Fish and Wildlife Service (FWS) Biological Opinion (BO) dated September 24, 2002, required that Mosaic Fertilizer, LLC (Mosaic), formerly IMC Phosphates Company, to submit an annual report describing habitat management activities conducted in accordance with Mosaic's approved Florida scrub-jay (*Aphelocoma coerulescens*) Habitat Management Plan (HMP). According to Terms and Condition 6 in the BO, Mosaic shall monitor, on an annual basis, reclaimed scrub sites occupied by Florida scrub-jays, all unmined occupied baseline survey sites on the Four Corners/Lonesome Regional Mine Areas, and the Mosaic Wellfield. Monitoring requirements were built into the HMP with sufficient intensity to document: a) the response of Florida scrub-jays to all reclamation, restoration, and habitat management activities (Appendix A: Florida Scrub-jay Nesting and Territory Report); and B) the distribution and status of the resident Florida scrub-jay populations on Mosaic lands (Appendix B: Figures 1 – 3).

As part of the BO, Mosaic, in coordination with various agencies and Florida scrub-jay experts, developed and implemented a comprehensive Florida scrub-jay management plan that maximizes the long-term probability of persistence of the M4 metapopulation with minimal short-term risks. Preliminary Habitat Suitability Index (HSI) modeling (Breininger 1992) and demographic analyses of the 14 Florida scrub-jay families extant on mine sites in 2001 suggested that: 1) a majority of these families were reproductive sinks whose occupied habitat could not easily be restored; and 2) without immediate aggressive habitat management, the onsite population would almost certainly decline below 10 families in the next decade (2002-2012). Based on these findings, Mosaic initiated a Florida scrub-jay HMP in 2002. The HMP provides a combination of onsite reclamation, native habitat enhancement, and restoration to maximize and increase the viability of the M4 metapopulation. Management efforts to date have included: 1) restoring, enhancing, and managing existing scrub habitat on mine sites, preserves, and the Mosaic Wellfield using proven restoration techniques; 2) providing supplemental food sources to increase jay productivity; and 3) monitoring the results of these management efforts.

This report summarizes the activities and results of habitat management from August 1, 2023, through July 31, 2024. Management continued on mine sites, preservation areas, and the Mosaic Wellfield with the following objectives:

1) Manage pine height and coverage;
2) Manage height of xeric oaks so that all individual trees are susceptible to fire;
3) Continue use of prescribed fire as the principal management technique;
4) Create/manage at least 10-20 percent bare ground/open space in all Florida scrub-jay habitats;
5) Establish habitat units for management of territories; and
6) Maintain 50 percent of the scrub habitat in optimal condition.

In addition, a feeding program was initiated in 2001 in order to:

1) Maximize the survivorship and reproductive potential of Florida scrub-jays on Mosaic lands;
2) Increase overall breeder success;
3) Aid in stabilizing populations where active management or mining is nearby; and
4) Aid in acclimating individuals in order to trap, band, and translocate.

Feeder locations were modified each year to ensure a feeder is present within each Florida scrub-jay territory. Automated feeders were added in 2008 to provide a more consistent food source of raw, shelled peanuts prior to and during the breeding season (February 1–July 1). However, automated feeding was discontinued in 2009, as the supplemental feeding was logistically difficult to manage, and the short-term benefits were not evident. However, waxworms were provided to each family group after each nest check to minimize any negative impacts of disturbances on the provisioning to young. It is unlikely that waxworm provisions have meaningful effects to increase productivity, but rather was meant to offset a missed feeding that might otherwise occur during a nest check.

In an effort to monitor and determine the response of Florida scrub-jays to management activities, Mosaic contracted qualified biologists to assist with nesting surveys and territory mapping of Florida scrub-jays on the Mosaic Wellfield and Duette Preserve. Surveys for Florida scrub-jays were conducted on all the previously occupied baseline survey sites on Mosaic property for a period of three years after they were determined to be unoccupied. The Texaco Tract was added as a donor site in a permit amendment in 2009 due to habitat quality decline and reduced reproductive productivity of the jays on the property. It was feared that the jays may no longer be extant at the time mining was planned to occur, and that translocating those remaining jays would be a greater benefit to the population. Additional properties surveyed included the Mosaic Wellfield, portions of the Southwest Florida Water Management District (SWFWMD) lands immediately south of the Mosaic Wellfield, and Duette Preserve. Surveys were not conducted on Florida Department of Environmental Protection's (FDEP) Little Manatee River State Park, Florida Fish and Wildlife Conservation Commission's (FWC) Moody Branch Wildlife and Environmental Area (WEA). However, Jay Watch monitors these populations once per year in July, and the results of those surveys were utilized annually in this report. Surveys began at Beker State Park in 2021 after habitat restoration had taken place and habitat was in optimal condition. The West Tract Preserve (Site 11) was surveyed for Florida scrub-jays two times per year until 2021. All surveys were conducted by broadcasting taped Florida scrub-jay vocalization play back calls in accordance with the approved methodologies (Fitzpatrick et al. 1991). These surveys were conducted between the hours of 0630 and 1200. If Florida scrub-jays were found within a management unit, territory surveys were conducted to delineate the estimated territory boundary for each family.

In addition to the above surveys, extensive nesting surveys were conducted throughout the breeding season on the Mosaic Wellfield, Duette Preserve, and the Edward W. Chance Preserve – Coker Tract (beginning in 2018), and Beker State Park (beginning in 2023). The results of the nesting surveys and territory mapping are provided in Appendix A. Ongoing banding took place as needed throughout the year. The last Florida scrub-jay translocation associated with the FWS permit was conducted in December 2010.

2.0 HABITAT MANAGEMENT

This Twenty-third Annual (2024) Florida scrub-jay HMP Report was prepared in accordance with Condition 6 of the BO as described above. The following provides a detailed account of Mosaic's Florida scrub-jay populations and site-specific management activities that have been performed between August 1, 2023, and July 31, 2024. In addition, the response of the Florida scrub-jays to management activities and recommendations for habitat management during the subsequent year are included.

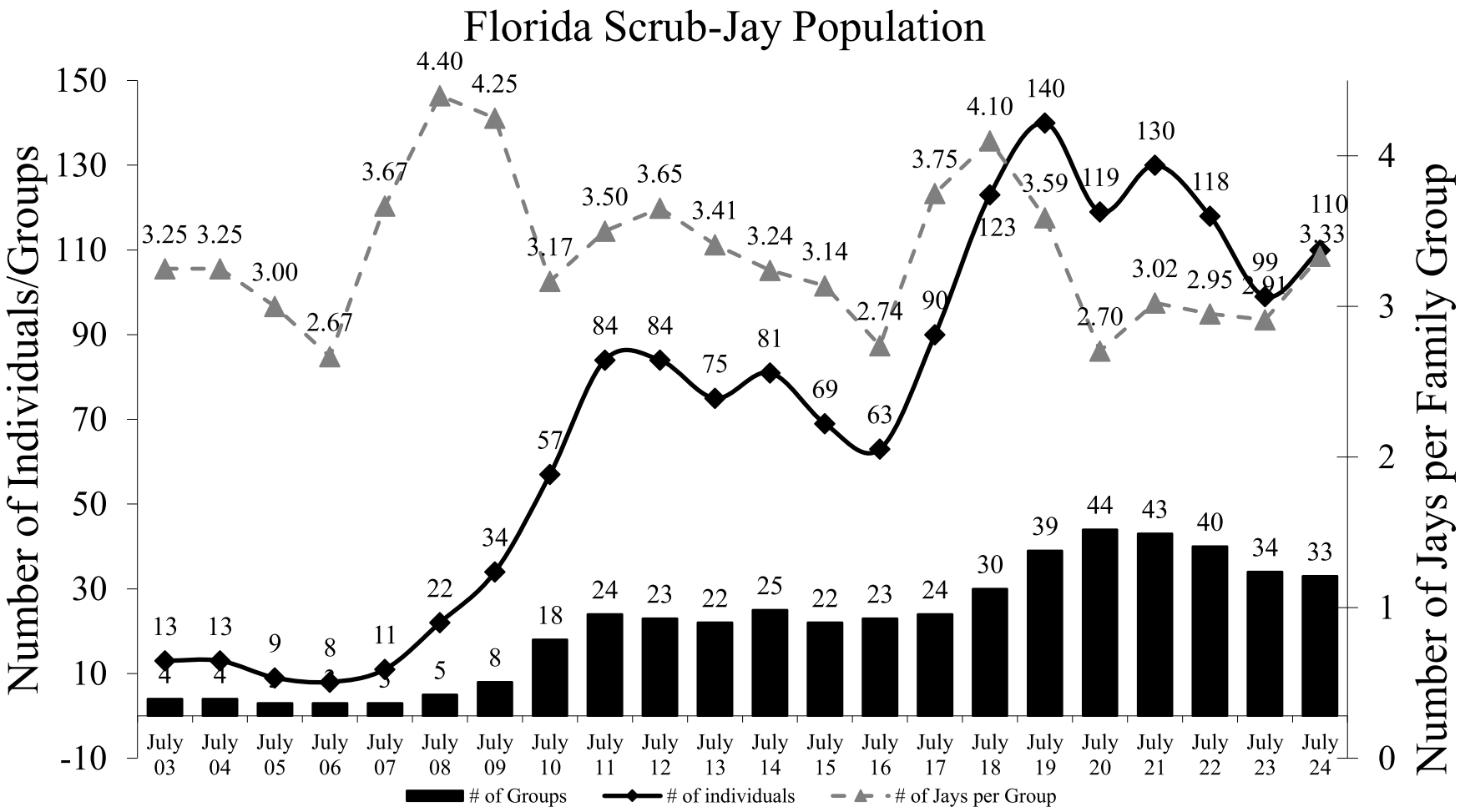
2.1 Mosaic Wellfield

2.1.1 Current Habitat Management

Prescribed burns were conducted as part of the ongoing management of suitable habitat for Florida scrub-jays at the Mosaic Wellfield. These included prescribed burns of MU 7 on October 5, 2016, MU 8 on October 6, 2016, and MU 6 on November 18, 2016. Chemical control of cogongrass (*Imperata cylindrica*) and natalgrass (*Melinis repens*) is ongoing and cover by invasives kept to a minimum, well below 0.5 percent. An additional prescribed burn was conducted in October 2019. In January of 2019, MU 5 was burned on the South Wellfield, and mechanical treatment followed in December 2019. Because the burn did not reduce the structure to be suitable for jays, mechanical treatment of MU 5 began in December 2019. During the winter of 2020, a small section of MW 5 was mechanically treated at the Mosaic Wellfield (Appendix B: Figure 14). Burns were planned for 2021, but Department of Forestry burn permits were unable to be acquired due to extreme weather conditions and were followed by the rainy season. Manatee County, collaborating with Mosaic, burned units MW3, MW4, MW12, MW13, MW14, MW15, and the northern half of MW11 between June 29 and July 1, 2022. (Figure 14). May 17, 2023 a prescribed burn was conducted in conjunction with Manatee County to burn MW2, MW1, MW10, and the southern half of MU11.

2.1.2 Florida Scrub-Jay Response to Management

The population of Florida scrub-jays on the Mosaic Wellfield originated at 8 individuals within two family groups in 2002, post restoration. In July of 2024, the population of birds associated with Mosaic's Translocation consisted of 110 individuals in 33 family groups on the Mosaic Wellfield, Duette Preserve, and the Coker Tract (Graph 1). While the number of family groups solely on the Mosaic Wellfield has declined to two family groups, recent habitat management should encourage population growth over the next few years. Descendants of the birds residing on the Mosaic Wellfield have dispersed into suitable habitat on Duette Preserve and other surrounding managed areas. In 2024, 51 of the 64 breeding Florida scrub-jays on Duette Preserve, Beker-Wingate State Park, and the Coker Tract were translocated or descendants from translocated Florida scrub-jays (79.7%).



Graph 1 ***Florida Scrub-Jay Demographics 2003-2024***
(Includes only groups associated with Mosaic's Translocation on the Mosaic Wellfield, Duette Preserve, Beker-Wingate State Park, and Edward W. Chance Preserve – Coker Tract)

2.1.3 Future Habitat Management

Portions south of State Road 64 of the Mosaic Wellfield are scheduled for a burn in 2024. Mechanical treatment (chainsaw cutting) is also scheduled for 2024 within the areas burned in 2023 to reduce any taller shrubs that were not top-killed in the burn. A mosaic of short, medium, and tall scrub shrubs exists, but the majority of the scrub oaks were above the optimal nesting height by the end of 2018. Where components of the scrub exceed 10 feet in height following fire, mechanical means will be utilized to reduce this structure to the ground. Manatee County Staff continue to coordinate management efforts with Mosaic, where properties abut, to provide suitable habitats for Florida scrub-jays.

2.2 Donor Sites

The status of the donor sites has not changed since 2020. Please refer to the Nineteenth Annual Florida Scrub-Jay Management Activity Report for more details.

2.3 West Tract Preserve (Site 11)

2.3.1 Current Habitat Management

The West Tract Preserve was burned on June 22, 2015, and in June 2022. Control of cogongrass is ongoing.

2.3.2 Florida Scrub-Jay Response to Management

No Florida scrub-jays resided at the West Tract Preserve after 2004; therefore, no response to management was recorded. Mosaic discontinued surveys in 2021 and will resume once habitat management has occurred to return the habitat to optimal conditions.

3.0 COORDINATION OF ACTIVITIES WITH ADJACENT PUBLIC LANDS

In 2024, Mosaic continued coordination with agency personnel and property owners adjacent to the Mosaic Wellfield to implement cooperative management strategies. These property owners include the SWFWMD, FDEP, and Manatee County. Continued cooperative coordination is desired to provide a holistic ecosystem management approach for Florida scrub-jays within the region. In 2022, Mosaic and Manatee County finalized an agreement to facilitate prescribed burns at the Mosaic Wellfield with the aid of Manatee County.

Between 2004 and 2007, Manatee County completed scrub habitat management, including sand pine (*Pinus clausa*) logging, mulling, and reduction in overgrown xeric oak in scrub habitat, and prescribed burning on Duette Preserve. These efforts are congruent with Mosaic's management efforts on the Mosaic Wellfield. SWFWMD also continues vegetation management, mainly with prescribed fire and to a lesser extent using mechanical means, on their property south of the Mosaic Wellfield. These collective management strategies are sustaining large expanses of Florida scrub-jay habitat along the Manatee River corridor Integrated Habitat Network and should help to perpetuate the M4 Florida scrub-jay metapopulation. Continued responsive habitat management within the region will allow Florida

scrub-jay populations in the region to grow and reoccupy managed scrub areas where the species was historically extirpated due to poor habitat quality. As part of the HMP for the Mosaic Wellfield, Mosaic continues to color-band immigrant Florida scrub-jays and juveniles on its property and will coordinate banding efforts on the adjacent SWFWMD and Duette Preserve properties as well as Beker State Park. Continued banding of Florida scrub-jays in the metapopulation will help track the response of the metapopulation to Mosaic's translocation.

4.0 CONCLUSION

Based on data collected during the nesting and territory surveys, as of July 31, 2024, a minimum of 110 Florida scrub-jays from 33 family groups contributed to Mosaic's permit criteria. A total of 65 juveniles fledged at the Mosaic Wellfield, Duette Preserve, Beker State Park, and Coker Tract in 2024, and as of the July 2024 census, 39 were still surviving.

Habitat management on all sites occupied by Florida scrub-jays and those unoccupied habitats with conservation easements (West Tract Preserve) were meeting the objectives within the HMP of maintaining proper scrub habitat structure. Habitat management activities planned for late 2024 and early 2025 will sustain and improve the condition of scrub habitat and the adjacent non-scrub habitats.

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Twenty-Third Annual Florida Scrub-Jay Nesting and Territory Report

USFWS Biological Opinion for Service Log No. 00-171a



January 2025

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1.0 INTRODUCTION

To assess the success of the Mosaic Fertilizer, LLC (Mosaic) Florida scrub-jay (*Aphelocoma coerulescens*) translocation, the long-term persistence of Florida scrub-jays on the Mosaic Wellfield, and to satisfy the permit criteria set forth in the U.S. Fish and Wildlife Service's (FWS) Biological Opinion pertaining to U.S. Army Corps of Engineers (USACE) Permit ID Nos.: 199506794 (IP-ML) Mod. #6, 199905366 (IP-ML), and 199905332 9 (IP-ML), annual monitoring of nesting activities and habitat use (territory surveys) were conducted for the subset of Florida scrub-jays associated with Mosaic's Florida scrub-jay translocation that included regular censusing of translocated Florida scrub-jays, their family groups, and their descendants.

Territory and nesting surveys were conducted for all translocated Florida scrub-jays, their descendants, and their family groups, if they resided on the Mosaic Wellfield, Duette Preserve, Beker-Wingate State Park, and Edward W. Chance Preserve – Coker Tract (Coker Tract). Any of the aforementioned birds residing on other public properties including the Florida Department of Environmental Protection's (FDEP) Little Manatee River State Park and Florida Fish and Wildlife Conservation Commission's (FWC) Moody Branch Wildlife and Environmental Area (WEA) were surveyed by Jay Watch but were not included in the nesting and territory surveys. Mosaic's West Tract Preservation Area (Site 11) was not surveyed from 2021 - 2024 as the habitat has not supported jays for some time. A portion of Best of the West was surveyed after a single jay was located in 2019 and 2020. The single jay was not located in 2021 and surveys did not resume.

The Mosaic Wellfield was the recipient site for Mosaic's eight Florida scrub-jay translocations. This property is located in portions of Section 34, Township 34S, Range 21E and Sections 3 and 4, Township 35S, Range 21E in Manatee County, Florida (Figure 4). The Mosaic Wellfield comprises several habitats including xeric scrub oak, pine flatwoods, and ephemeral herbaceous and forested wetlands on the edges of the property. Over 600 acres of this property is a suitable habitat for Florida scrub-jays.

Site 1 was a donor site located in portions of Section 34, Township 31S, Range 21E in Hillsborough County (Figure 5). This site has been mined and reclamation activities are ongoing.

The Altman Tract (Site 4) was a donor site located in portions of Section 12, Township 33S, Range 22E in Manatee County (Figure 6) and has been mined. Reclamation activities are ongoing.

The West Tract Preserve (Site 11) is located in the southwest portion of Section 24, Township 32S, Range 21E in Hillsborough County (Figure 7). The property is under a conservation easement for Florida scrub-jays and is being managed by the Southwest Florida Water Management District (SWFWMD) which includes prescribed burns to maintain healthy scrub suitable for Florida scrub-jays.

Taylor Gill Road (Site 12) was a donor site located in a portion of Section 16, Township 32S, Range 22E in Hillsborough County (Figure 8) and has been mined and reclamation activities are ongoing.

Site 13 was a donor site located in portions of Sections 9 and 10, Township 33S, Range 21E in Manatee County (Figure 9). This site has been mined with the exception of the southwest corner (LB-13[A]). Management of the remaining scrub habitat is being considered.

Site 18 was a donor site located in portions of Sections 27 and 26, Township 32S, Range 21E in Hillsborough County (Figure 10). Mining has been completed in this area and reclamation activities are ongoing.

Relevant Conservation Lands

Duette Preserve is owned and managed by Manatee County. It encompasses over 22,000 acres of native habitats and is located adjacent to the north, east, and west of the Mosaic Wellfield (Figure 1). Duette Preserve comprises 47 land sections (Table 1). Manatee County continues to institute prescribed burning and selective mechanical treatments. The preserve comprises 4,647 acres of suitable scrub habitats within a matrix of other native habitats.

Table 1 Land Sections within Duette Preserve

Section	Township	Range
27	33S	21E
33	33S	21E
34	33S	21E
19	33S	22E
30	33S	22E
31	33S	22E
2	34S	21E
3	34S	21E
4	34S	21E
9	34S	21E
10	34S	21E
11	34S	21E
12	34S	21E
13	34S	21E
14	34S	21E
15	34S	21E
16	34S	21E
20	34S	21E
21	34S	21E
22	34S	21E
23	34S	21E
24	34S	21E
25	34S	21E
26	34S	21E

Section	Township	Range
27	34S	21E
28	34S	21E
29	34S	21E
32	34S	21E
33	34S	21E
34	34S	21E
35	34S	21E
4	34S	22E
5	34S	22E
6	34S	22E
7	34S	22E
8	34S	22E
9	34S	22E
10	34S	22E
15	34S	22E
16	34S	22E
17	34S	22E
18	34S	22E
19	34S	22E
20	34S	22E
21	34S	22E
30	34S	22E
2	35S	21E

The FDEP Little Manatee State Park is located in Section 19, Township 32S, Range 20E in Hillsborough County (Figure 4).

FWC's Moody Branch is located in Sections 5-7, Township 33S, Range 21E in Manatee County (Figure 4). Restoration of overgrown scrub habitats is ongoing on this property.
SWFWMD's South Fork Tract is in Sections 18 and 20, Township 33S, Range 21E in Manatee County (Figure 4).

Beker-Wingate State Park is located in Sections 6,7, and 18, Township 35S, Range 22E, in Manatee County (Figure 2)

2.0 METHODOLOGY

2.1 Nest Monitoring

Detailed surveys of nests were conducted between March and July 2024 according to methodologies obtained from Archbold Biological Research Station. These methodologies ensure that the observer can accurately identify incubation start dates, clutch sizes, hatch dates, hatching success, fledgling success, and fledgling survival. Nests were located by observing the behavior of the breeding pair within each group until the nest was located. If a nest was located during construction, the nest was checked every two days until the clutch was complete, then on day nine and 19 of incubation. Nestlings were checked on hatch day, day five, banded on day 11 with a United States Geological Survey (USGS) numbered federal metal band and three colored plastic bands, day 16, and day 18. Fledglings were checked every seven days thereafter to monitor survival until July. If a nest failed, nest searching resumed.

Nest monitoring was reduced in 2020 at the request of Manatee County. These changes reduced our ability to collect incubation start dates and clutch size while all other parameters of nest data were largely complete. The new methodologies are described here. If a nest was located during construction, the nest was checked every three to seven days until the clutch was complete, depending on the stage of nest construction. If incubation start date could be determined, we did not check the nest again until day 18 of incubation (hatch day). If incubation start could not be determined, the nest was checked every seven days until nestlings were observed. Nestlings were checked and banded on day 11-13 with a federal and three colored bands. Fledging was confirmed approximately 18 days after hatching. Fledglings were checked two weeks after confirming fledging to determine if they survived or a new nest was attempted. If a nest failed, nest searching resumed. Adjustments in nest checks were necessary to avoid disturbing scheduled deer and turkey hunts on the weekends. In 2023 we reduced nesting efforts further to generally only first and second nest attempts (a nest attempt defined as a complete nest containing eggs). As nest attempts later in the season more often fail than fledge, monitoring later nest attempts does not lead to a significant increase in banded individuals by the July census.

Other data recorded include species and height of shrubs or trees containing nests, height of each nest above the ground (to the rim of the nest cup), group hierarchy, and mortalities. In July 2024, a scrub-jay census was performed to determine the number of surviving young, helpers, and breeders within each group.

2.2 Territory Sketching

Generalized territory locations for Florida scrub-jay family groups were conducted throughout the breeding season by mapping observed locations of the breeding pair and territory defense. Locations were collected during the February census, nest searching, nest monitoring, and the July census. Each breeding pair was represented by a minimum of three locations and an average of 17 locations. Between 2003 and 2009, territory estimates followed guidelines published in the Non-Game Wildlife Program Technical Report No. 8, published by the Florida Game and Freshwater Fish Commission's Office of Environmental Services (Fitzpatrick 1991). New methods were adopted in 2010 so that general group locations, once compiled into a minimum convex polygon, encompassed all nest attempts within the polygon. All Florida scrub-jay locations were mapped for each breeding pair within the Mosaic Wellfield, Duette Preserve, the Coker Tract, and Beker-Wingate State Park. Each group location boundary was then delineated in Geographical Information Systems (GIS) using minimum convex polygons. We used separate minimum convex polygons to represent this group within each scrub polygon.

2.3 Presence/Absence Surveys

Presence/absence surveys were conducted at the beginning of the breeding season on donor sites associated with Mosaic's Florida scrub-jay Translocation for three years after Florida scrub-jays were removed from those sites. In 2021, these surveys were also conducted at Best of the West where a single jay had been observed in 2019 and 2020. Wingate Creek State Park was also surveyed beginning 2024 as the recently restored habitat was now in optimal condition and the park is in close proximity to the Mosaic Wellfield. Giley Creek and Southfork Preserves were surveyed to identify and locate any banded birds that may have dispersed from the core population (MW, Duette, Coker). In 2022 and 2023, Southfork Preserve was not occupied by any jays while Giley Creek has several known family groups. In February 2024 two jays were located in Southfork Preserve, both genetically sexed as females from the 2023 cohort; one jay from natal group N Beker A, and the other from DP41A. Surveys were conducted using recorded Florida scrub-jay territory vocalizations broadcast loudly at different locations within the scrub habitat (Fitzpatrick 1991).

3.0 RESULTS

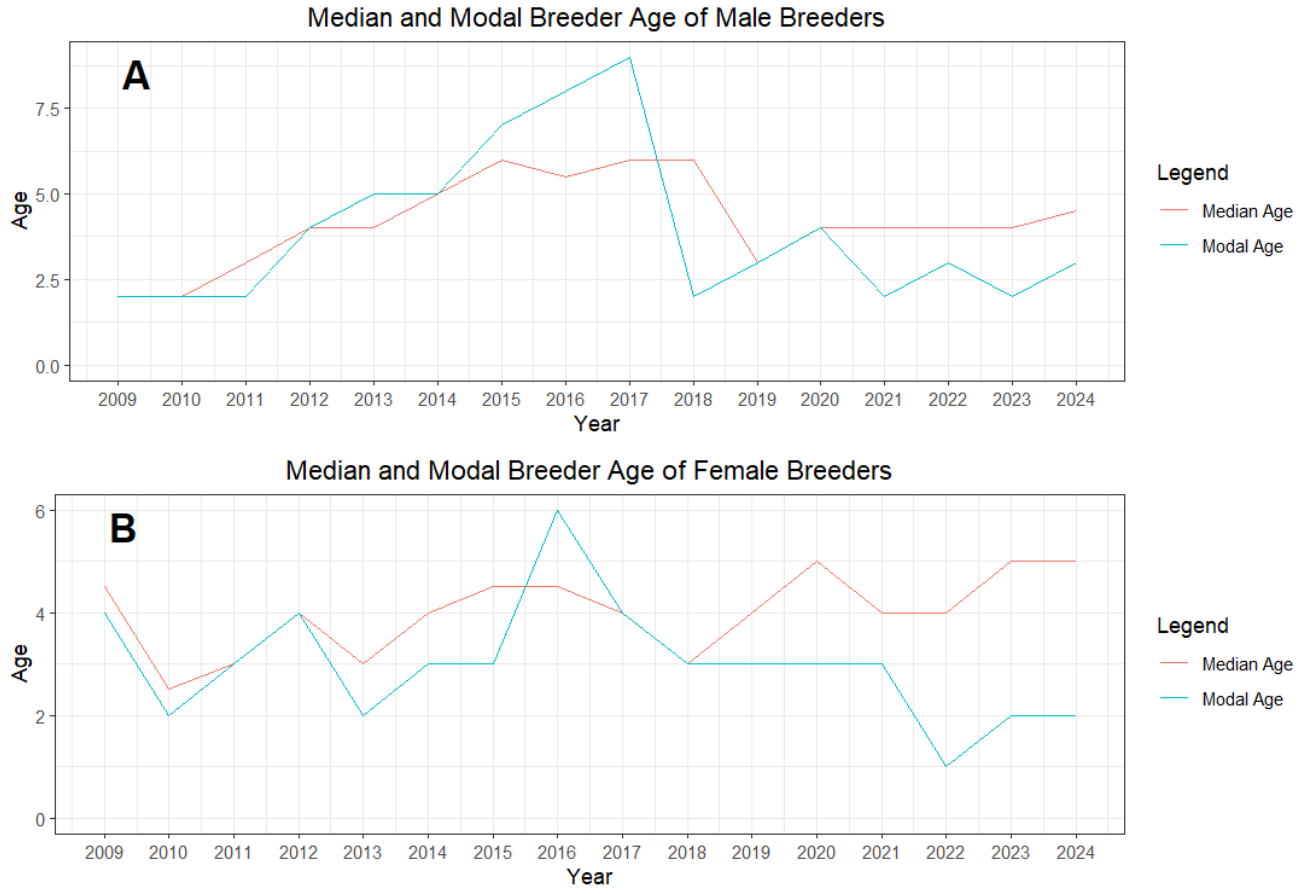
The following summary refers only to Florida scrub-jays that previously existed on the Mosaic Wellfield, were translocated to the Mosaic Wellfield, were known descendants of translocated Florida scrub-jays to the Mosaic Wellfield, naturally immigrated to the Mosaic Wellfield, or resided in any group containing one or more of the aforementioned jays on Duette Preserve, the Coker Tract, or Wingate-Beker State Park. Detailed nesting surveys for the Coker Tract were included beginning in 2019 because all family groups residing on the Coker Tract were descendants of translocated jays and were part of a connected subpopulation with the jays on the Mosaic Wellfield and Duette Preserve. In 2023, Wingate-Beker was added after two birds, both descendants of translocated jays, established a pair on the northern end of the property. Duette Preserve, the Coker Tract, and the Mosaic Wellfield serves as the mainland in the mainland-island metapopulation structure of the M4 metapopulation (Genetic Unit F).

During the February 2024 census, prior to the Florida scrub-jay breeding season, there were two groups consisting of 4 individuals on the Mosaic Wellfield, five groups consisting of 13 individuals on the Coker Tract, 25 groups consisting of 59 individuals on Duette Preserve, and one group consisting of three jays at Beker-Wingate State Park. Thus, at the onset of the breeding season, there was a total of 33 groups containing 79 individuals consisting of translocated jays or their descendants. The mean birds per group was 2.39 (Table 2). This represents the nadir of the annual population cycle before the new breeding season and influx of juveniles are recorded. At the end of the 2024 Florida Scrub-jay breeding season, in July, when the population is at its greatest during the calendar year, there were two groups consisting of four individuals on the Mosaic Wellfield, three groups consisting of 16 individuals on the Coker Tract, and 27 groups consisting of 84 individuals on Duette Preserve. Thus, at the end of the breeding season, there was a total of 33 groups containing 110 individuals with a mean number of 3.34 birds per group.

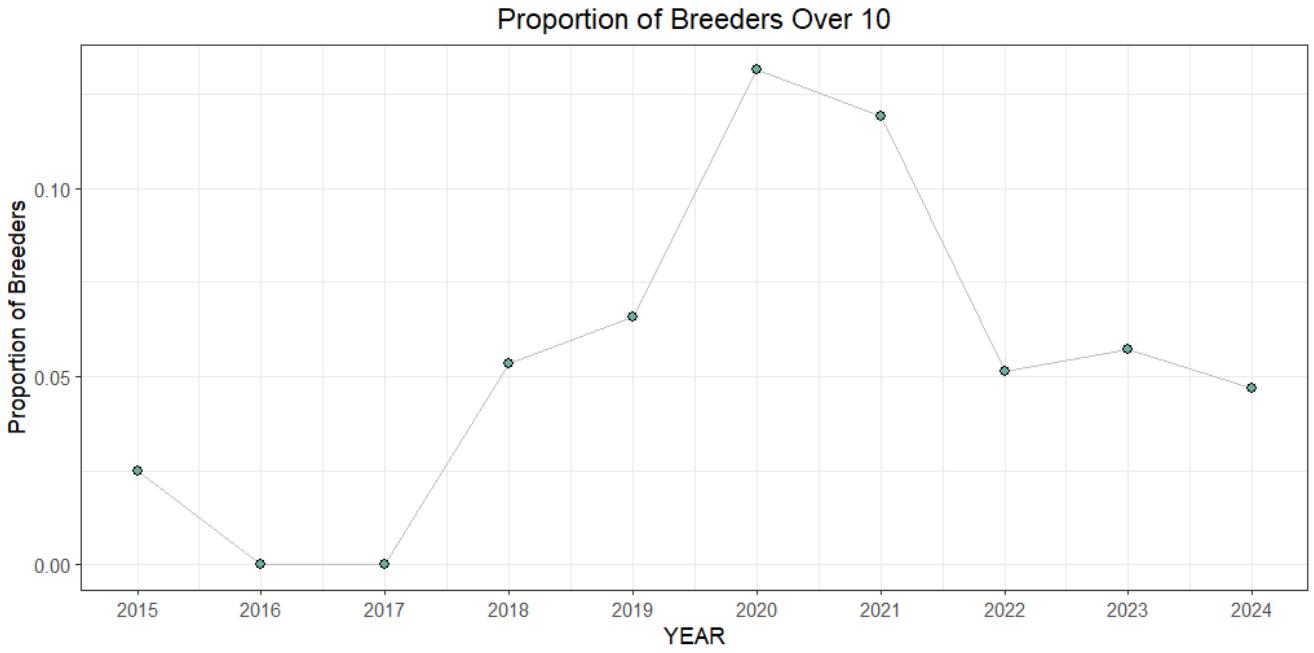
Table 2 Florida Scrub-Jay Demographics Prior to and Post Breeding Season

Property	Groups	Individuals
	February 2024/July 2024	
Mosaic Wellfield	2/2	4/4
Duette Preserve	25/27	59/84
Coker Tract	5/3	13/16
Wingate-Beker State Park	1/1	3/6
Total	33/33	79/110

The modal age of male and female breeders in 2024 was three and two years, respectively. The median age for male and female breeders was 4.5 and 5.0 years, respectively. Less than five percent of breeders were over the age of 10 years. Male and female breeders generally follow the same pattern over time. We examined patterns from 2009-2024, as sample sizes prior to 2009 for known age breeders were insufficient (Graph 1A (Males) and 1B(Females)). The median and modal age of breeding jays at Archbold Biological Station is 5-6 years and 3 years, respectively (Wooflenden & Fitzpatrick 1984). In addition, at Archbold Biological Station the proportion of breeders over the age of 10 years is much higher than in our monitored population (20%, Wooflenden & Fitzpatrick 1984) (Graph 2).



Graph 1 **The median and modal breeding age of male (A) and female (B) Florida scrub-jays from 2009-2024.**



Graph 2 **The proportion of breeders (both male and female) over 10 years old within the core population (Mosaic Wellfield, Duette Preserve, Coker Tract, Wingate-Beker State Park). Overall proportion is lower than that reported at Archbold Biological Station (20%)**

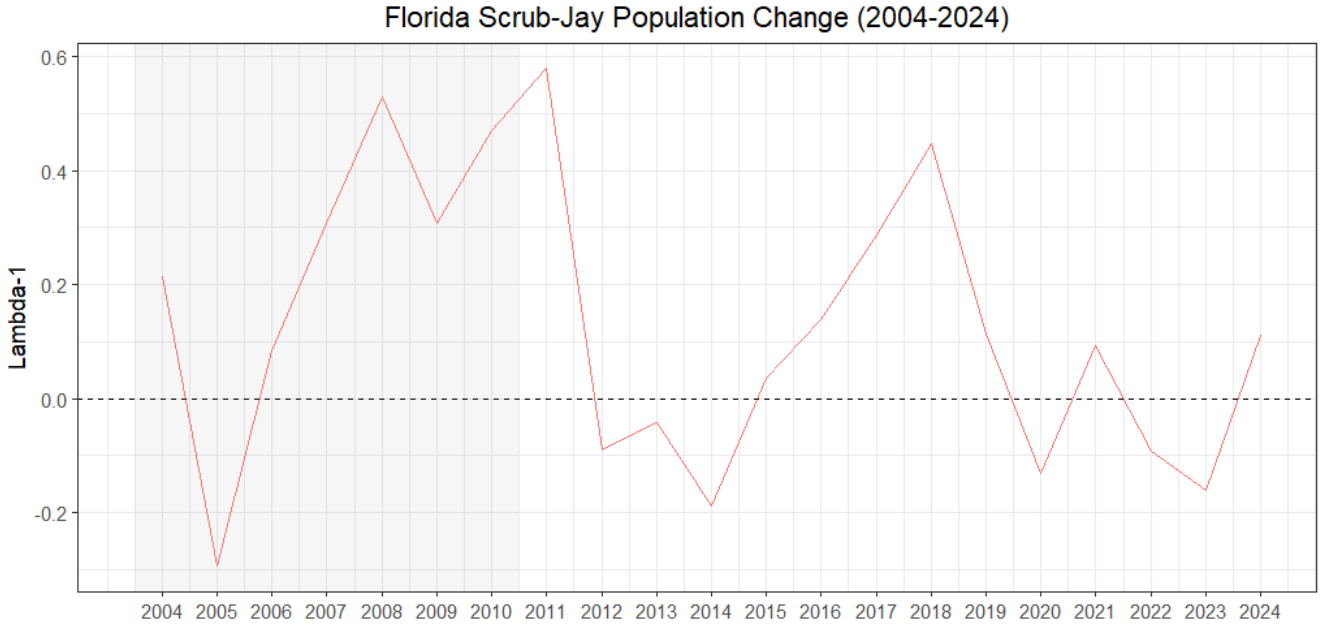
Between July 2023 and July 2024 fifteen apparent breeder mortalities occurred (25%). This is in line with the average breeder mortality for our monitored population, but higher than expected when compared to Archbold Biological Station (Woolfenden and Fitzpatrick 1984).

Table 3 **Annual Survival Rates of Breeding Adults (2013-2024)**

	Female			Male			
Year	**N**	**Deaths**	**Annual Mortality**	**N**	**Deaths**	**Annual Mortality**	**Mean Survival**
2013	23	7	0.3	23	3	0.13	0.78
2014	23	6	0.26	23	6	0.26	0.74
2015	22	3	0.14	23	4	0.17	0.84
2016	24	5	0.21	22	6	0.27	0.76
2017	20	9	0.45	22	6	0.27	0.64
2018	23	3	0.13	25	4	0.16	0.85
2019	19	3	0.16	29	5	0.17	0.83
2020	23	9	0.39	25	11	0.44	0.58
2021	24	9	0.38	24	6	0.25	0.69
2022	34	9	0.26	34	9	0.26	0.74

	Female			Male			
Year	**N**	**Deaths**	**Annual Mortality**	**N**	**Deaths**	**Annual Mortality**	**Mean Survival**
2023	36	9	0.25	33	10	0.3	0.72
2024	32	9	0.28	28	6	0.21	0.75
Total	**235**	**63**	**0.27**	**250**	**60**	**0.24**	**0.745 ± 0.023**

Of the fifteen breeder mortalities, three were of unknown age. Of the known age breeder mortalities between 2023 and 2024, the average age was 6.25 years. Mean annual breeder mortality for the groups we monitored between 2012-2024 was 25.5%; we excluded years during the translocation to avoid possible additive mortality due to the effects of the translocation. We calculated population change lambda as the number of adults (breeders and helpers) in the current year minus the number of adults the previous year. Lambda correlates to population growth when greater than zero (Graph 3). Since the translocations ended in 2010, the population has grown 115%.

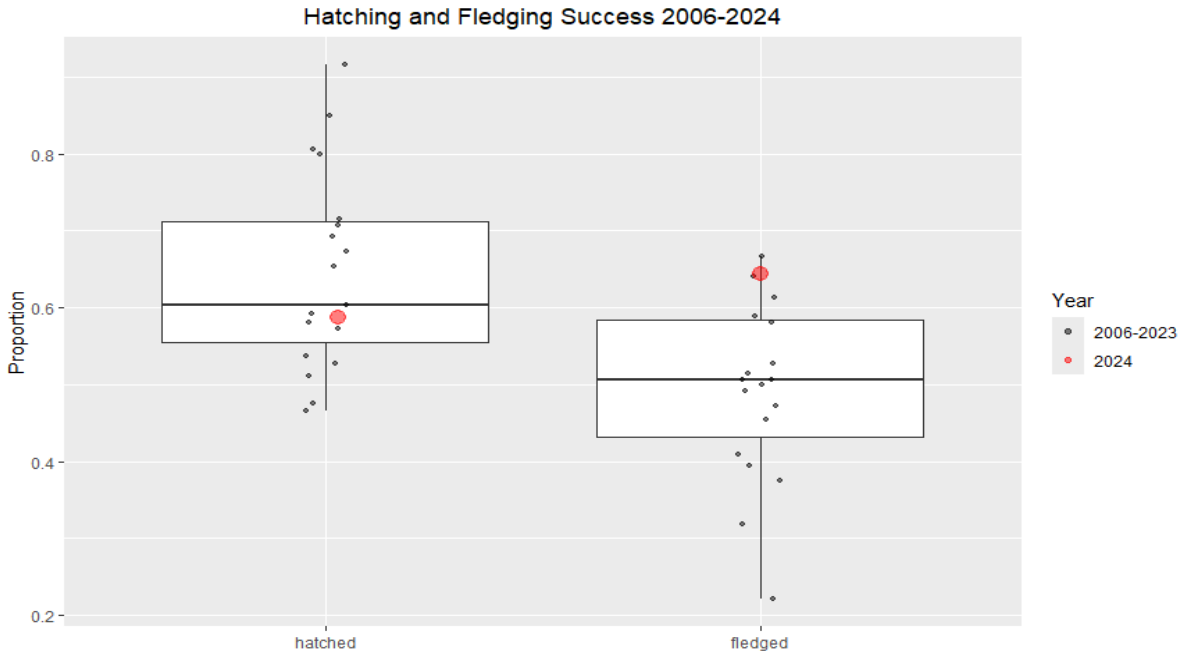


Graph 3 **Florida Scrub-Jay Population Change (2003-2024): Depicting the Translocated Core Population. The shaded area highlights the years birds were translocated to the Mosaic Wellfield.**

3.1 Nesting Surveys

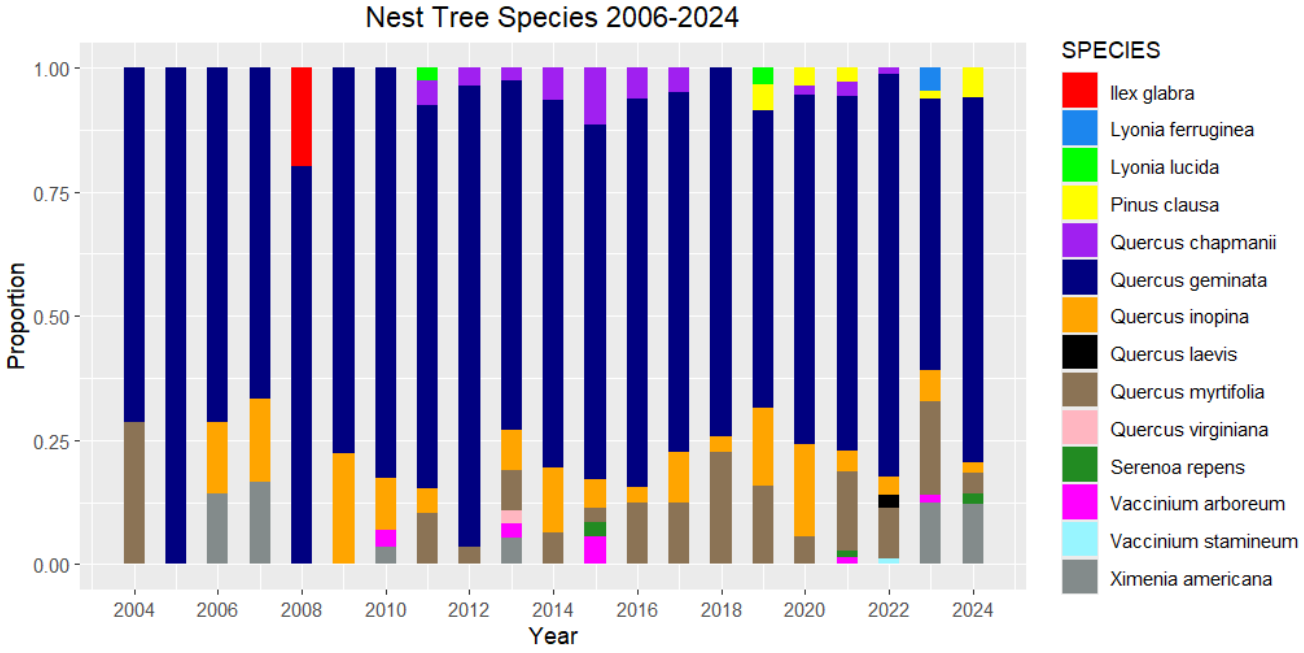
During the 2024 breeding season, 32 groups of Florida scrub-jays attempted to breed. Of these, 20 successfully fledged 65 young. As of July 31, 2024, 39 of 65 fledglings were accounted for. The first day of nest searching was March 11, 2024. Nests located during the first week and ranged

from a basket to containing five eggs. The average clutch size was 3.9, average hatching success (total eggs hatched of total eggs laid) was 59%, and average fledgling success (total fledged of total eggs hatched) was 64%. Compared to previous years, hatching success was average and fledging success was slightly above average (Graph 4).



Graph 4 **Hatching and Fledging Success of Florida Scrub-jays (2006-2024) (Red represents the most recent year (2024) compared to the minimum, interquartile range, median, and maximum values derived from the same population.)**

Forty-nine nests were observed and were constructed primarily in sand live oaks (*Quercus geminata*) (Graph 5). Most nests have been constructed in sand live oaks since monitoring began in 2004.



Graph 5 Proportion of Tree Species Used for Nesting 2004-2024 within the core population (Mosaic Wellfield, Duette Preserve, Coker Tract, Wingate-Beker State Park)

The average height of shrubs containing a nest was 9.1 feet, and the average nest height was 4.3 feet from the ground to the rim of the nest basket. Average nest measurements, hatching success, and fledging success are listed in Table 4. Hatching and fledging success are also depicted in Graph 4 with the current year highlighted in yellow to illustrate the annual variation.

Table 4 Comparative Nest Statistics (2006-2024)

Year	Average Tree Height (ft)	Average Nest Height (ft)	Average Clutch Size	Hatching Success	Fledging Success
2024	9.06	4.33	3.9	59%	64%
2023	8.95	4.34	3.8	72%	47%
2022	7.95	4.54	3.7	47%	50%
2021	8.54	4.20	3.6	61%	48%
2020	9.41	4.12	3.5	58%	39%
2019	8.64	4.36	3.7	71%	53%
2018	9.32	3.95	3.6	77%	59%
2017	8.39	4.07	3.5	57%	52%
2016	7.59	3.83	3.7	69%	79%
2015	8.42	4.17	3.5	54%	44%
2014	8.90	4.49	3.6	67%	22%
2013	9.37	5.23	3.0	53%	49%
2012	9.00	4.52	3.6	65%	41%
2011	8.39	4.43	3.7	53%	51%
2010	9.91	4.60	2.8	43%	60%
2009	8.13	3.94	3.1	84%	62%
2008	9.50	4.48	4.0	90%	56%
2007	10.31	4.02	4.0	92%	32%
2006	7.31	3.39	4.2	52%	21%

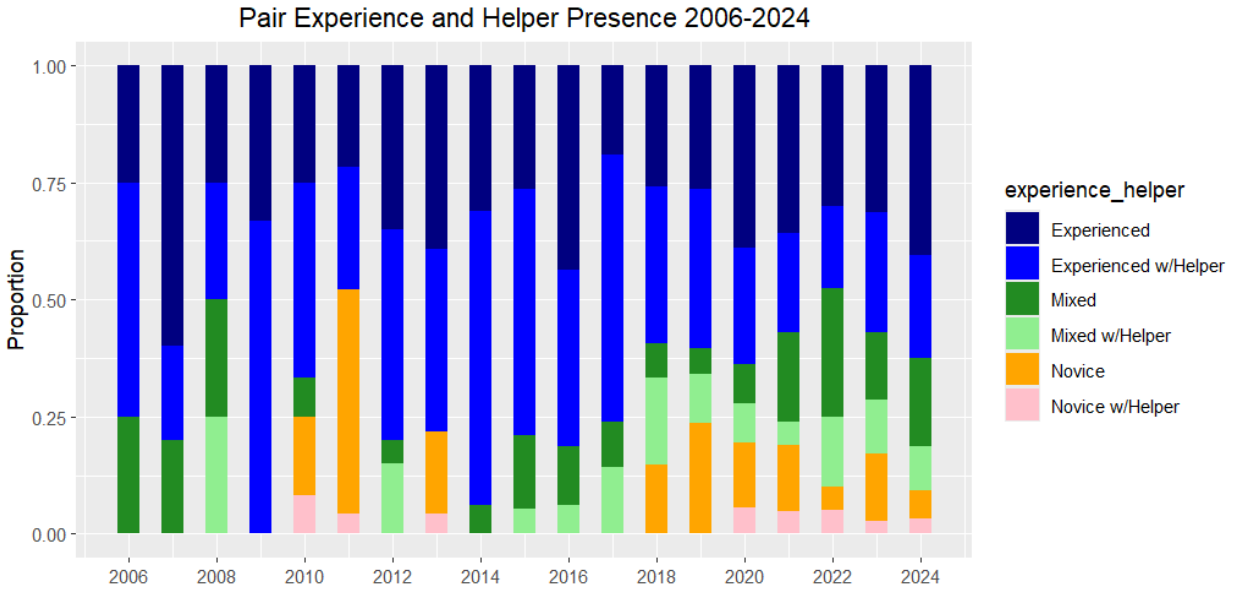
Of the 32 groups that attempted to nest, 20 groups were successful in fledging young. Fifteen groups fledged young from their first nest attempt, five from their second attempt. One double brood was observed in 2024 but the second nest was not successful. Twelve family groups did not fledge young in 2024 (Table 5).

Table 5 Reproductive Success of Each Family Group

Family Group	No. of Jays in Group	No. Breeders	No. Helpers	Nest Attempts	Total Eggs Laid	Eggs Hatched	Fledglings	Juveniles as of July
MWU	2	2	0	1	5	5	0	0
DP3A	2	2	0	1	4	4	4	2
DP10C	4	2	2	1	5	5	5	3
DP10E	3	2	1	2	6	2	1	1
DP11C	2	2	0	2	8	4	1	1
DP12B	3	2	1	3	8	6	3	3
DP12H	3	2	1	1	2	0	0	0
DP12I	3	2	1	2	7	7	1	1
DP12L	3	2	1	2	8	4	4	4

Family Group	No. of Jays in Group	No. Breeders	No. Helpers	Nest Attempts	Total Eggs Laid	Eggs Hatched	Fledglings	Juveniles as of July
DP16B	2	2	0	1	5	5	5	1
DP21A	2	2	0	1	4	3	0	0
DP35C	2	2	0	2	6	0	0	0
DP36A	3	2	1	1	3	1	1	0
DP36B	2	2	0	2	5	0	0	0
DP36E	2	2	0	1	4	4	3	2
DP36H	3	2	1	2	8	8	4	2
DP41A	2	2	0	1	4	4	4	2
DP42C	2	2	0	4	10	0	0	0
DP43B	2	2	0	1	3	2	2	2
DP43C	2	2	0	2	8	0	0	0
DP10F	2	2	0	1	4	3	3	1
DP19B	2	2	0	2	9	4	0	0
DP1J	2	2	0	1	3	3	3	1
DP1I	2	2	0	1	4	4	4	3
DP29A	2	2	0	2	9	4	0	0
NBekerA	3	2	1	1	4	4	4	3
NCokerA	3	2	1	1	4	4	4	4
NCokerB	2	2	0	1	4	4	4	1
SCokerA	4	2	2	1	5	5	5	3
WCokerA	2	2	0	1	4	2	0	0
DP12N	2	2	0	1	0	0	0	0
DP3B	2	2	0	3	9	0	0	0
Total	77	64	13	49	172	101	65	40
Mean	N/A	N/A	N/A	1.5	5.4	3.2	2.0	1.3

Pair experience varied in 2024 with 12.5% of groups consisting of novice pairs (where neither breeder had prior experience). While this is high compared to Archbold Biological Station, it is likely to be higher in an expanding population, such as this. This population also has a higher proportion of breeding positions created de novo, likely because there is ample space and lack of competition. Overall, the proportion of groups containing helpers was 34.3% (Graph 6). This statistic varied in other populations from 40-80% (Woolfenden & Fitzpatrick 1984).



Graph 6 The Proportion of the Monitored Population with Varying Degrees of Experience Over Time

However, because having a helper in a group increases reproductive success Station (Woolfenden & Fitzpatrick 1984), it is likely that in some years the low frequency of helpers among groups contributes to lower reproductive success. Data from Archbold Biological Station (Woolfenden & Fitzpatrick 1984) also indicates that novice breeders produce smaller clutches and fledge fewer young than experienced pairs on average. Pooled data from 2005-2024 from the MW, Coker Tract, and Duette Preserve, show a similar pattern of reproductive success and experience (Table 6, Graph 7). Helpers do not appear to effect reproductive success in this population, but experienced pairs appear to fledge younger than mixed or novice pairs. Our sample size of novice pairs with helpers is small (n=16) and some variation may be further explained if we split novices further into groups dependent on whether the individuals had spent time as a helper previously or not. However, our sample sizes are too small at this time to detect any notable differences. No statistics have been conducted for these data at this time.

Table 6 **Productivity of Florida Scrub-Jays by pair experience and helper presence; Mean ± SE**

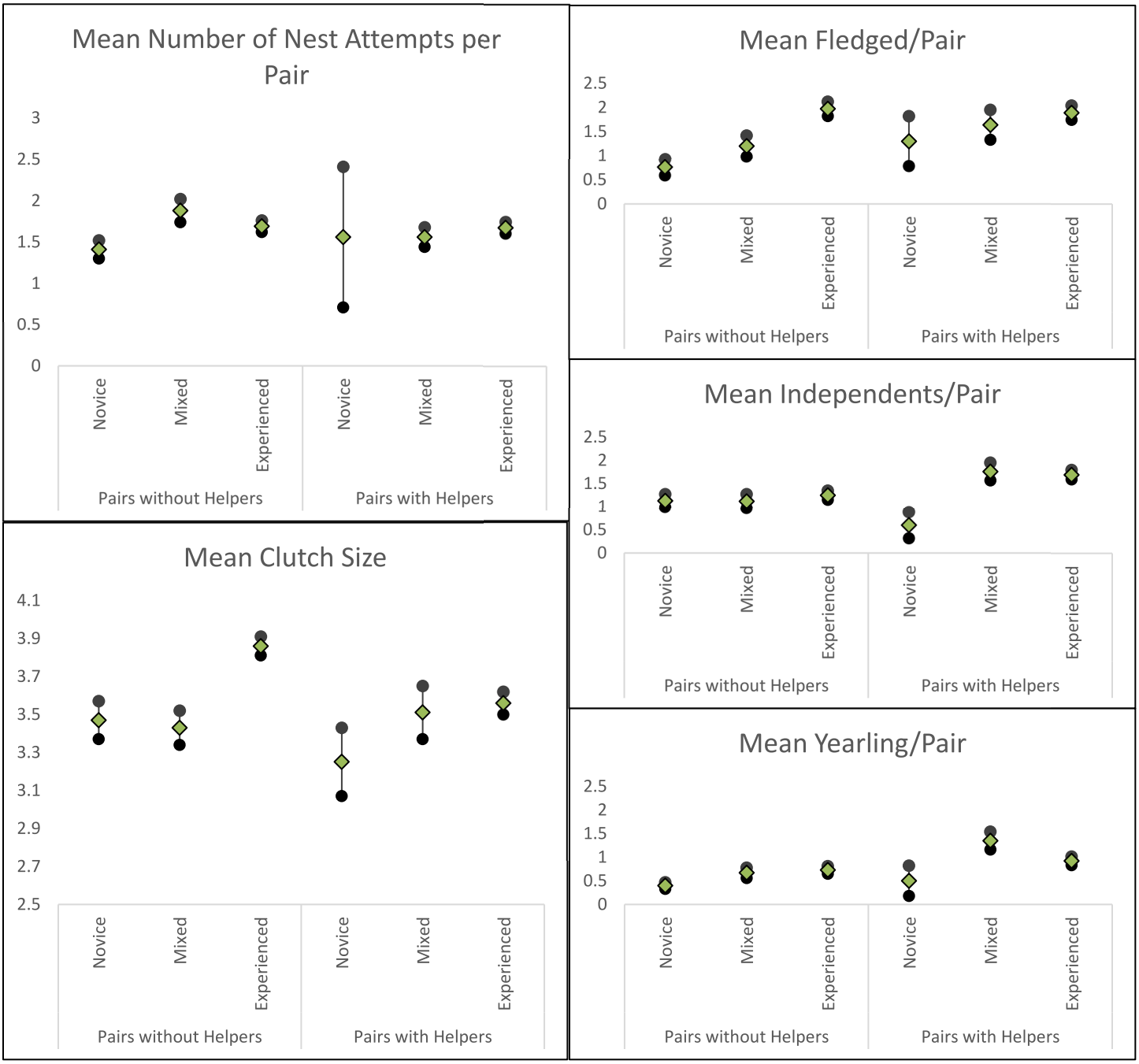
	Pairs without Helpers		Pairs with Helpers	
	No. pairs	Mean no. attempts	No. pairs	Mean no. attempts
Novice	46	1.41 ± 0.11	9	1.56 ± 0.85
Mixed	40	1.88 ± 0.14	32	1.56 ± 0.12
Experienced	111	1.69 ± 0.07	118	1.67 ± 0.07
Total	197	1.66 ± 0.06	159	1.64 ± 0.06

	Pairs without Helpers		Pairs with Helpers	
	No. nests	Mean clutch size	No. pairs	Mean clutch size
Novice	58	3.47 ± 0.1	12	3.25 ± 0.18
Mixed	69	3.43 ± 0.09	47	3.51 ± 0.14
Experienced	173	3.86 ± 0.05	184	3.56 ± 0.06
Total	300	3.68 ± 0.04	243	3.53 ± 0.05

	Pairs without Helpers		Pairs with Helpers	
	No. pairs	Mean Fledged/Pair	No. pairs	Mean Fledged/Pair
Novice	49	0.76 ± 0.17	10	1.3 ± 0.52
Mixed	45	1.2 ± 0.22	33	1.64 ± 0.31
Experienced	119	1.97 ± 0.15	130	1.89 ± 0.15
Total	213	1.53 ± 0.11	173	1.81 ± 0.13

	Pairs without Helpers		Pairs with Helpers	
	No. pairs	Mean Independent/Pair	No. pairs	Mean Independent/Pair
Novice	49	1.13 ± 0.14	10	0.6 ± 0.28
Mixed	45	1.12 ± 0.15	33	1.76 ± 0.19
Experienced	119	1.25 ± 0.1	130	1.69 ± 0.1
Total	213	1.21 ± 0.07	173	1.65 ± 0.09

	Pairs without Helpers		Pairs with Helpers	
	No. pairs	Mean Yearling/Pair	No. pairs	Mean Yearling/Pair
Novice	49	0.4 ± 0.07	10	0.5 ± 0.32
Mixed	45	0.67 ± 0.11	33	1.35 ± 0.19
Experienced	119	0.73 ± 0.08	130	0.92 ± 0.09
Total	213	0.67 ± 0.06	173	1.03 ± 0.08



Graph 7 **Comparison of pair experience and presence of helper on clutch size, eggs hatched, and nestlings fledged, no. independents, and no. yearlings; mean ± SE**

3.2 Family Group Locations

Generalized locations were mapped for 32 family groups of Florida scrub-jays at the Mosaic Wellfield (Figure 11), Duette Preserve (Figure 12), and the Coker Tract (Figure 13). These estimates are primarily used to guide habitat management needs. They should not be used to infer territory size as the methodology to obtain the locations is largely incidental.

3.3 Presence/Absence Surveys

The last remaining Florida scrub-jays from Mosaic's regional source population were translocated in December 2010 to the Mosaic Wellfield. No Florida scrub-jays were observed on the source habitats that were surveyed in 2020 and were discontinued until any remaining habitat is managed. A survey was conducted at Wingate Creek State Park in February 2023 and one pair of jays were observed, both immigrants from the core, and descendants of translocated jays. After obtaining the necessary permits, we monitored this pair for reproductive success starting in 2023.

3.3.1 Relevant Public Conservation Lands

Most of the surviving translocated birds and their descendants reside on the Mosaic Wellfield, Duette Preserve, or the Coker Tract, which together represent the mainland core of the M4 metapopulation. However, a few birds emigrated from the core and now reside on public property that is managed to maintain suitable habitat for Florida scrub-jays. These properties are farther than the average dispersal distance of a scrub-jay from the mainland core and by definition, act as islands within a mainland-island metapopulation structure. These emigrant birds and their family groups count towards Mosaic's permit criteria to maintain 14 family groups of Florida scrub-jays.

FDEP'S LITTLE MANATEE RIVER STATE PARK

During the 2017 breeding season, this group consisted of one jay. This group was not included in our nest monitoring efforts. As of July 31, 2017, no juveniles were documented with this group. Jay Watch surveys this FDEP Park, and no jays have been observed since 2017.

FWC'S MOODY BRANCH WEA

Two second year immigrant male jays emigrated from group 10B at Duette Preserve to Moody Branch WEA in the fall of 2013 (HS-BF and GS-PF). GS-PF was a helper for one year in group CMOOD before becoming a breeder in group NMOOD. He remained a breeder through 2017. HS-BF joined group CMOOD as a helper in 2014 and became the breeder in the same group in 2015. He remained the breeder male in that group through 2016. He joined a neighboring group as a helper until securing a breeding position in AMOOD in 2019 where he remained though 2022. One offspring of HS-BF immigrated to Duette Preserve to form group 16C in 2018 (HS-BF). Two juveniles were observed with this group in July 2018. These groups were not included in these nest monitoring efforts. Data was provided by Florida Department of Environmental Protection and Jay Watch. In

2021, F-HAS, who was banded as a hatch year on the Mosaic Wellfield, was observed at Moody Branch. This bird was a helper from Group MWC through July 2017 and then was not observed at the Wellfield thereafter. We do not know when this bird first arrived at Moody Branch, but this bird was still present as a helper in May 2023. Three birds from the core immigrated to Moody Branch in late 2022: WWZ-F was a female from the 2021 cohort on the Coker Tract, PZ-LK was from the 2022 cohort on the Mosaic Wellfield, and BZ-AK was from the 2022 cohort on Duette Preserve. All three were in a group together on Moody Branch in 2023 and WWZ-F was the breeding female and paired with a local resident. It is apparent that in recent years movement between Moody Branch and the core (Mosaic Wellfield, Duette Preserve, and the Coker Tract) is becoming more frequent. Results from JayWatch 2024 were not available at the time of this report.

SOUTHFORK TRACT – (CORDELL)

During the 2019 breeding season, Jay Watch did not observe any birds resulting from Mosaic's Translocation on the South Fork Tract. In 2020 there was one adult and two juveniles at this site. No band combinations were reported. The results from Jay Watch surveys in 2021 indicated that no jays were observed during the surveys. We did not locate any jays during our surveys in 2022 and 2023. In 2024 two birds were located on Southfork in February. One was from the 2023 cohort from natal group DP41A (ZK-BA), and the other was form the 2023 cohort from natal group North Beker A (ZK-GA). Both of these birds were genetically sexed as female. In July there was also an unbanded juvenile observed near them, but it was hanging out alone on the periphery of the two banded birds, was not observed begging, pr participating in sentinel foraging with the other two birds. We believe it is a Juvenile making forays from Moody Branch directly across the creek.

GILLEY CREEK

Results from 2021 indicate that PG-FS, a 2019 male offspring of Duette Preserve group 43C, was observed on the south end of the property. This bird fledged from the group's first nest attempt. The pair double brooded in 2019, but the second nest failed. In 2022, PG-FS was not observed. In February 2022 we surveyed Gilley Creek in February and again in July. No additional birds from the Mosaic Wellfield, Duette Preserve, or Coker Tract were observed at Gilley Creek in either February or July 2022. However, unbanded immigrants were observed in Duette Preserve in July 2022 and it is likely that those immigrants are from either Gilley Creek or Moody Branch. In February 2022, there were five groups comprising 13 individuals at Gilley Creek. In July 2022, there were four groups comprising 17 individuals including eight juveniles. In February 2023, there were four groups comprising 14 individuals at Gilley Creek. In July 2023, there were five groups comprising 20 individuals including eight juveniles. In July 2024, there were five groups composed of 16 individuals including 4 juveniles at Gilley Creek.

BEST OF THE WEST

One jay was observed at the Best of the West Tract in 2019 and 2020 but was not observed in surveys performed in 2021. Surveys were not conducted in 2022 - 2024.

4.0 CONCLUSIONS

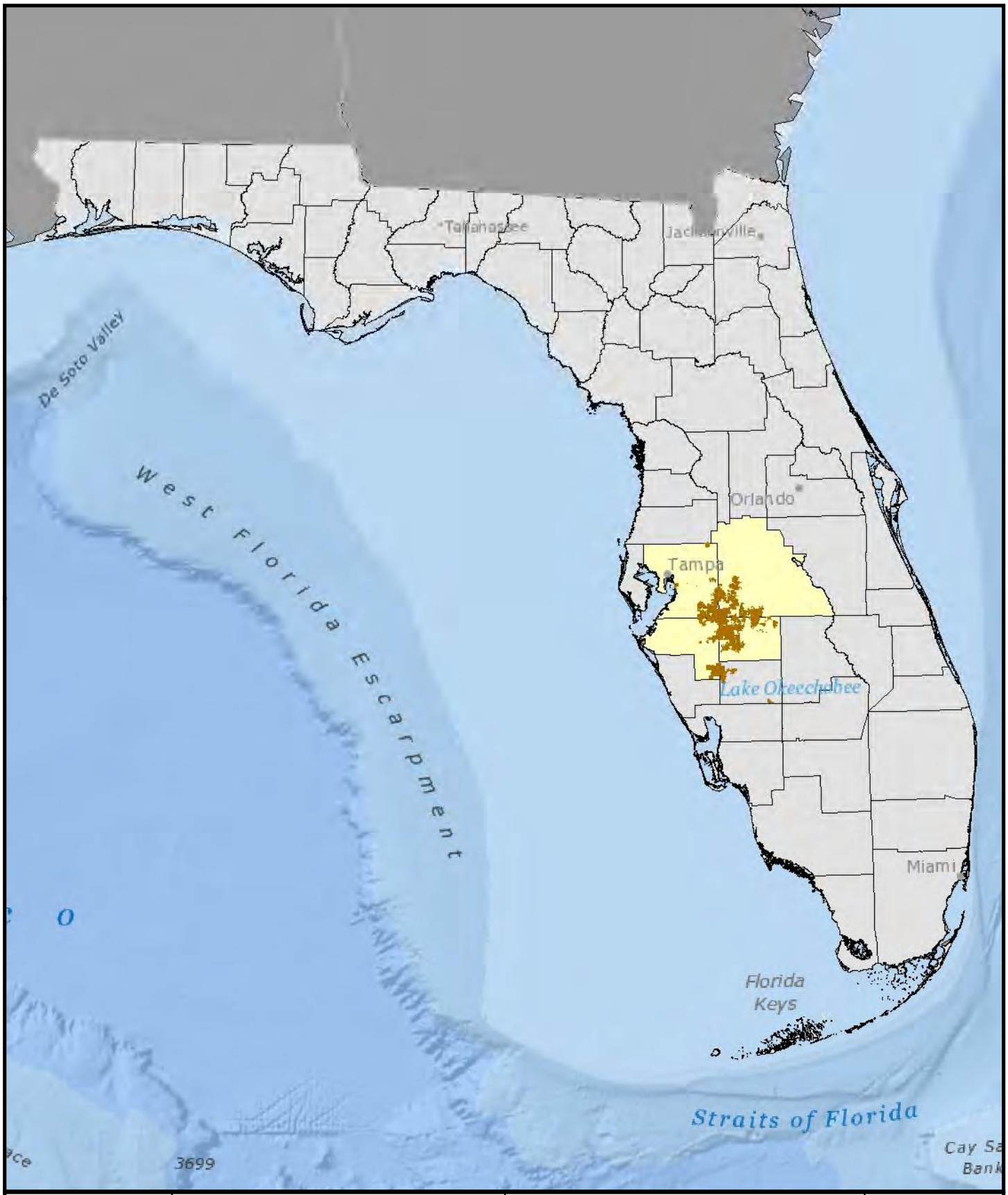
The 2024 Nesting Season produced average year of hatching and above average fledging success when compared to previous years. The Florida scrub-jay population had remained relatively consistent since the last translocation in 2010 through July 2017. Between July 2017 and July 2018, the population grew by 33 individuals and six family groups. During this same time period, group sizes also increased from 3.83 to 4.17 jays per family group. From July 2018 to July 2019 the population increased by 15 individuals and nine family groups. The number of jays per group fell to 3.58 as expected with such rapid growth in the number of groups. Many second- and third-year helpers dispersed and formed these new groups, reducing their natal group size. From July 2019 to July 2020, the number of individuals fell from 136 to 119, and the average group size fell from 3.58 to 2.77. However, the number of family groups rose from 38 to 43 in 2020. In 2021, the population only grew by one family group, likely due to low reproductive success in 2020. From July 2021 to July 2022, the population fell from 44 to 40 family groups, a likely response to the increased breeder mortalities in 2020 and 2021 coupled with the reduced recruitment in 2021. Negative growth rates in 2023 (Graph 3) indicate that we might expect a decline in the population in 2024, while growth rates were positive in 2024. Management on the Mosaic Wellfield continues and we anticipate that birds will recruit back into these habitats as the structure becomes more optimal.

At the end of the 2024 nesting season, during the July census, there were a total of 33 Florida scrub-jay groups comprising at least 110 individuals within the Mosaic Wellfield, Duette Preserve, the Coker Tract, and Wingate-Beker State Park that contribute towards meeting the mandated 14 family groups as described in the Incidental Take Permit (ITP). This far exceeds the mandated requirement, and there were likely a couple of birds missed during the census as seasonal dispersal activities had begun by this time.

5.0 REFERENCES

Fitzpatrick, J.W., G.E. Woolfenden, and M.T. Kopeny. 1991. Ecology and Development-Related Habitat Requirements of the Florida scrub-jay (*Aphelocoma coerulescens*). Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 8.

Woolfenden, G.E., and J.W. Fitapatrick. 1984. The Florida Scrub-Jay: Demography of a cooperative Breeding Bird. Princeton University Press; Princeton.



Miles
0 65
1 in = 65 miles

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FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

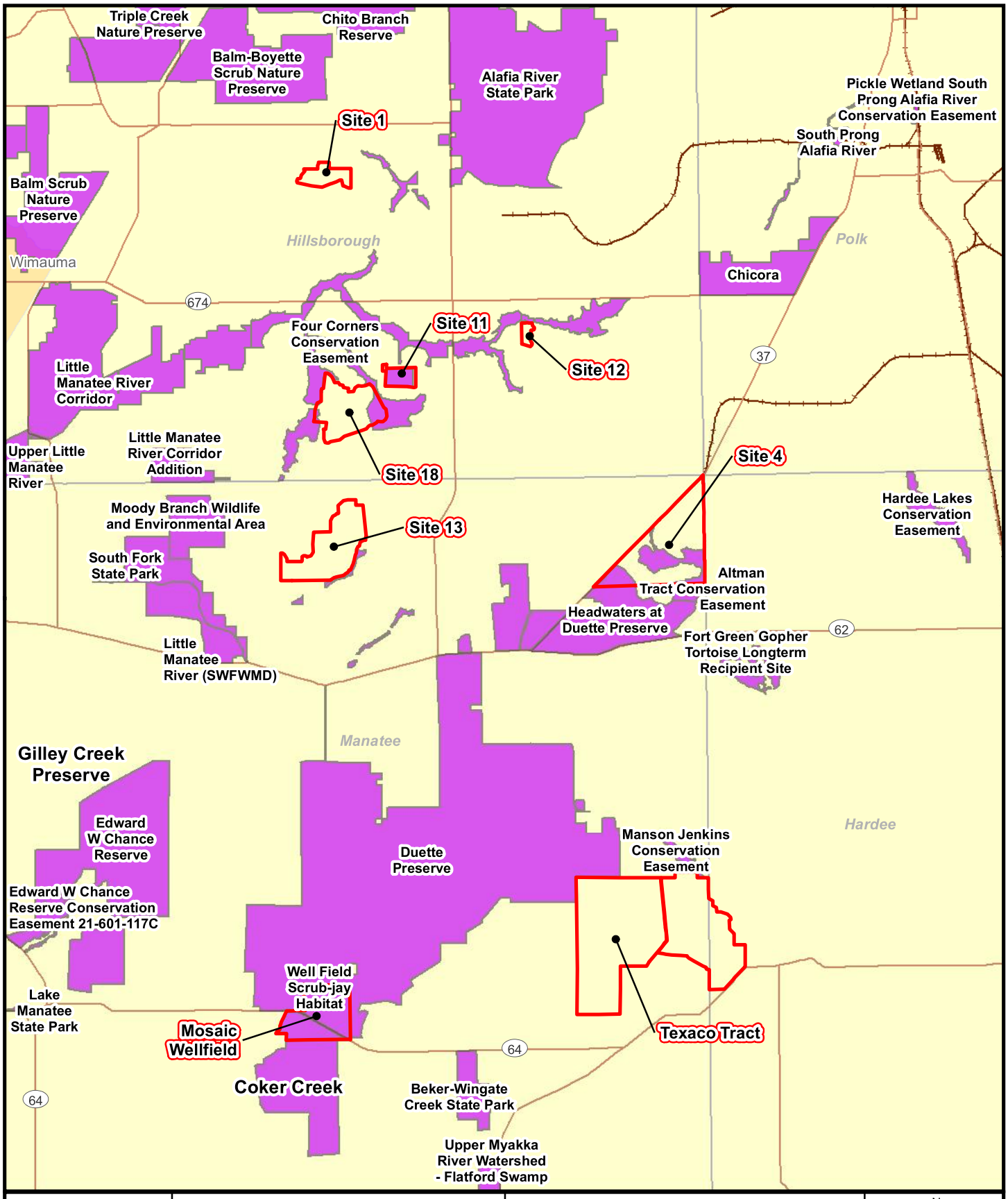
HARDEE, HILLSBOROUGH MANATEE, AND POLK COUNTIES, FLORIDA

Mosaic Holdings
Local Counties
Florida

N
W E
S

FIGURE 1
VICINITY MAP

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 1.mxd



Miles
0 3
1 in = 3 miles

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FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

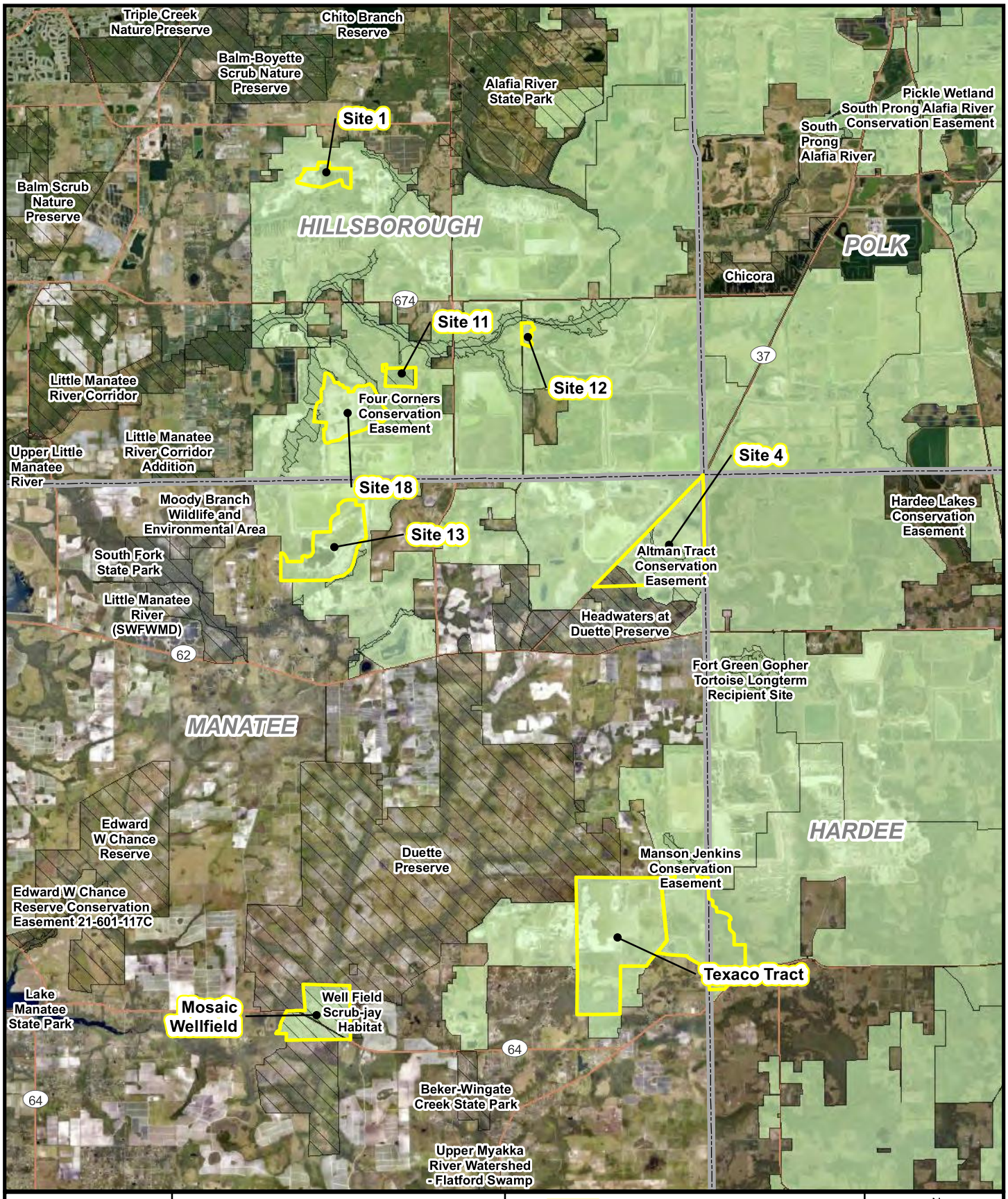
Site Boundaries

Florida Conservation Lands 2023

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FIGURE 2
FSJ SITE
LOCATIONS

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 2.mxd



Miles
0 3
1 in = 3 miles

FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

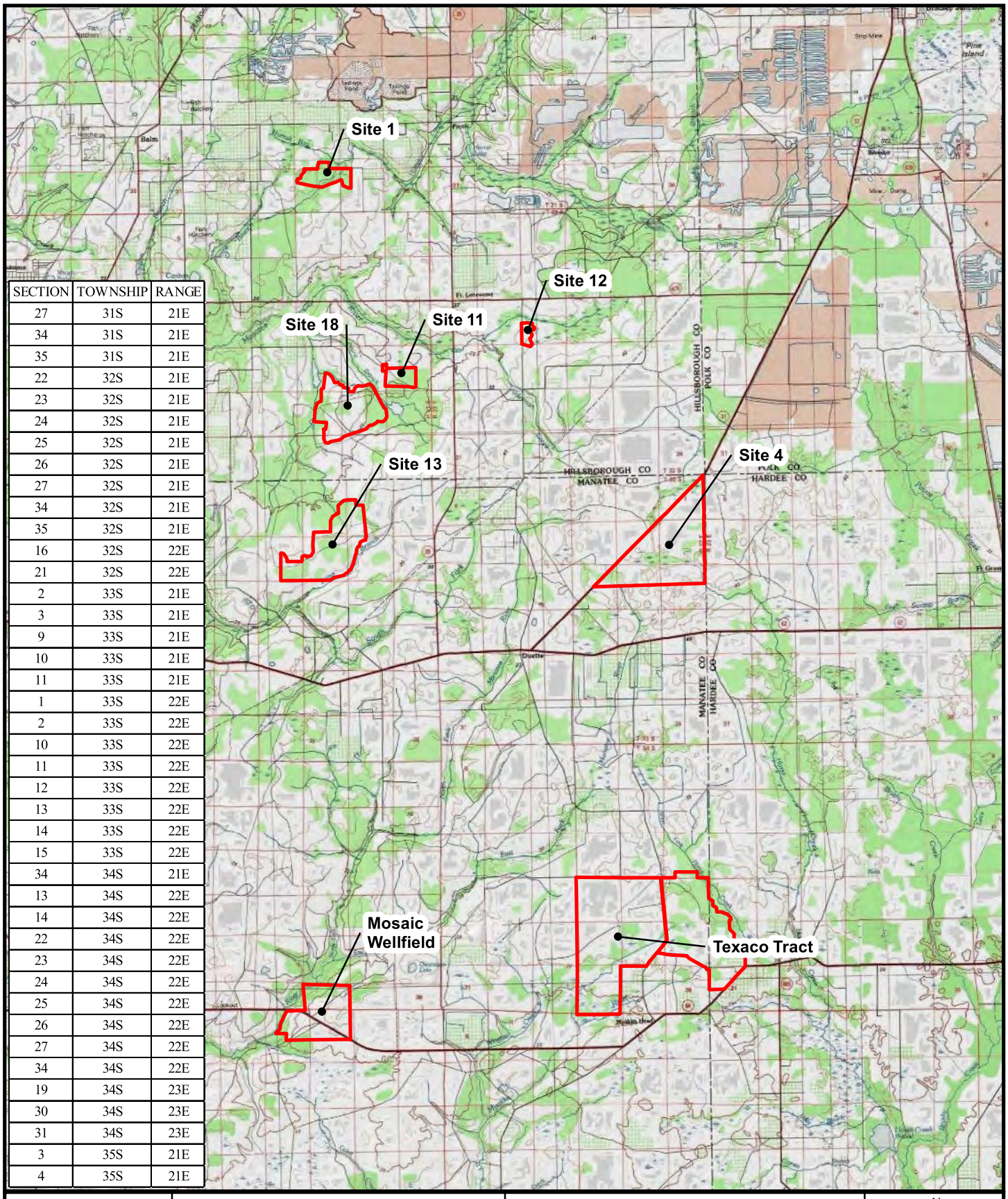
HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

- Site Boundaries
- County Lines
- Mosaic Holdings
- Florida Conservation Lands 2023

N
W E
S

FIGURE 3
AERIAL
LOCATION MAP

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SECTION	TOWNSHIP	RANGE
27	31S	21E
34	31S	21E
35	31S	21E
22	32S	21E
23	32S	21E
24	32S	21E
25	32S	21E
26	32S	21E
27	32S	21E
34	32S	21E
35	32S	21E
16	32S	22E
21	32S	22E
2	33S	21E
3	33S	21E
9	33S	21E
10	33S	21E
11	33S	21E
1	33S	22E
2	33S	22E
10	33S	22E
11	33S	22E
12	33S	22E
13	33S	22E
14	33S	22E
15	33S	22E
34	34S	21E
13	34S	22E
14	34S	22E
22	34S	22E
23	34S	22E
24	34S	22E
25	34S	22E
26	34S	22E
27	34S	22E
34	34S	22E
19	34S	23E
30	34S	23E
31	34S	23E
3	35S	21E
4	35S	21E

Miles
0 3
1 in = 3 miles

FLATWOODS Consulting Group

FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

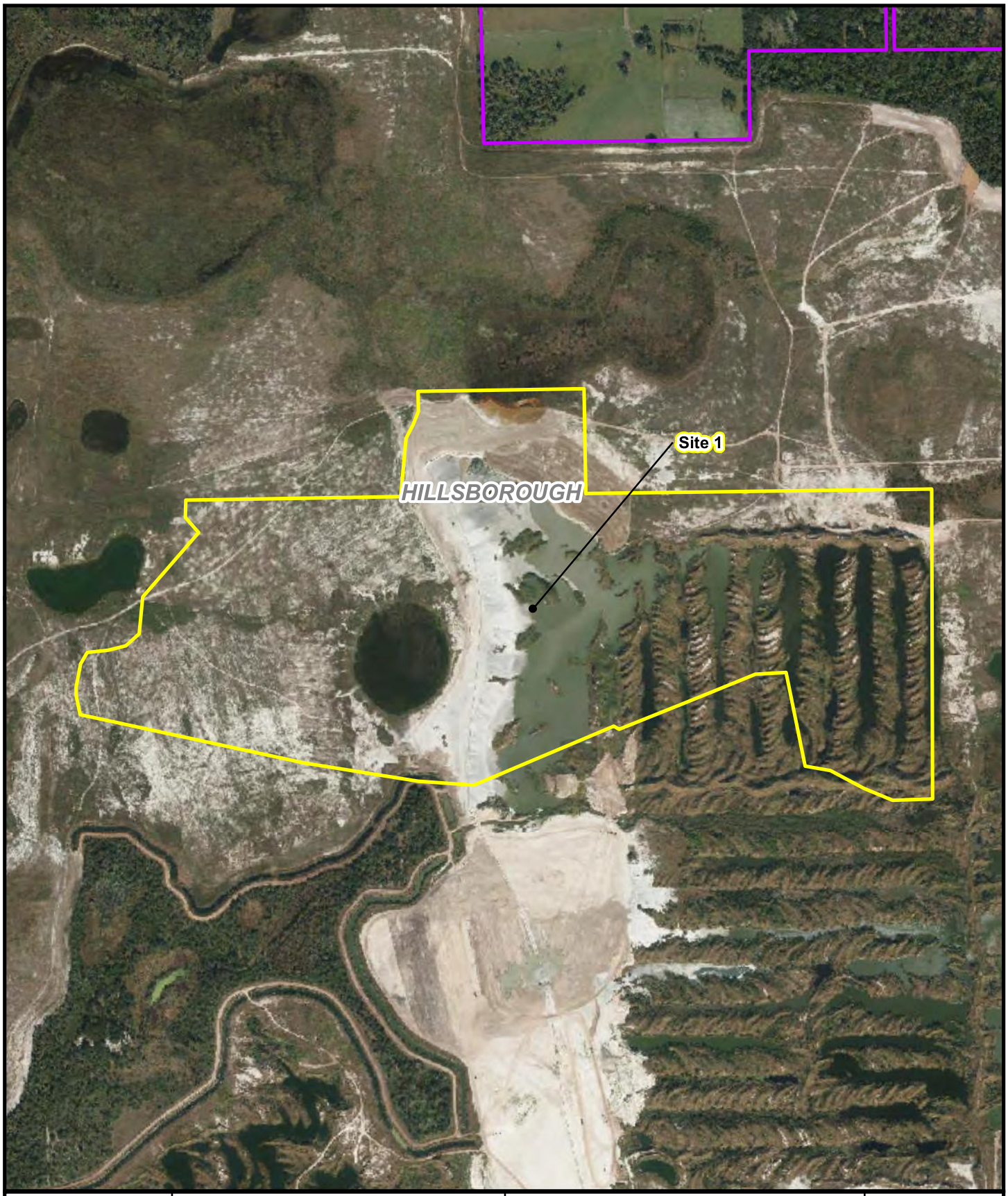
HARDEE, HILLSBOROUGH MANATEE, AND POLK COUNTIES, FLORIDA

Site Boundaries

N
W E
S

FIGURE 4
QUAD MAP

P:\0003MOS\117-FSJ Monitoring\GIS\FIGURE 4 QUAD.mxd



Feet
0 1,000
1 in = 1,000 feet

FLATWOODS Consulting Group

FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

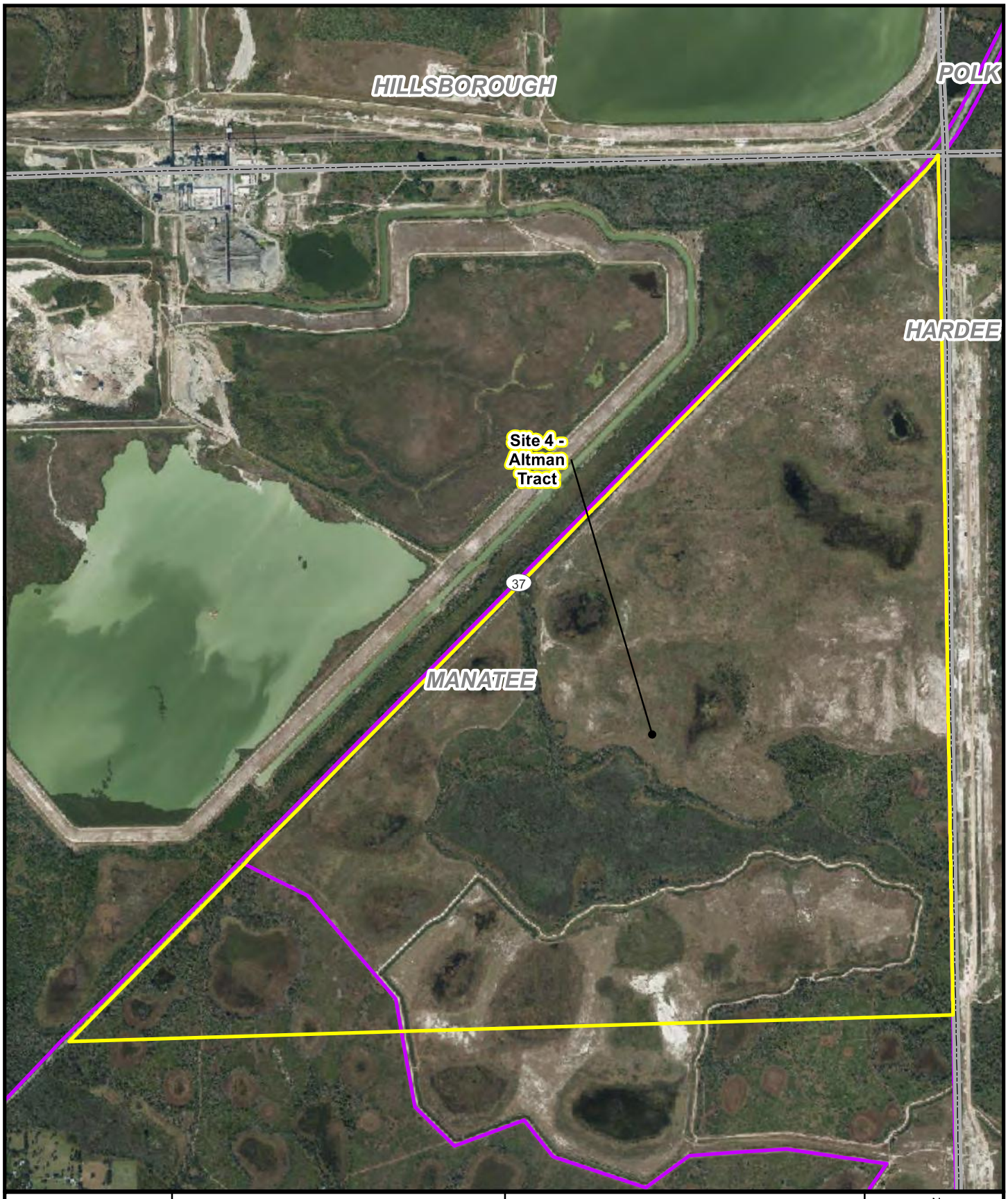
HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

Site Boundaries
County Lines
Mosaic Holdings

N
W E
S

FIGURE 5
SITE 1
AERIAL

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 5.mxd



Feet
0 2,000
1 in = 2,000 feet

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FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

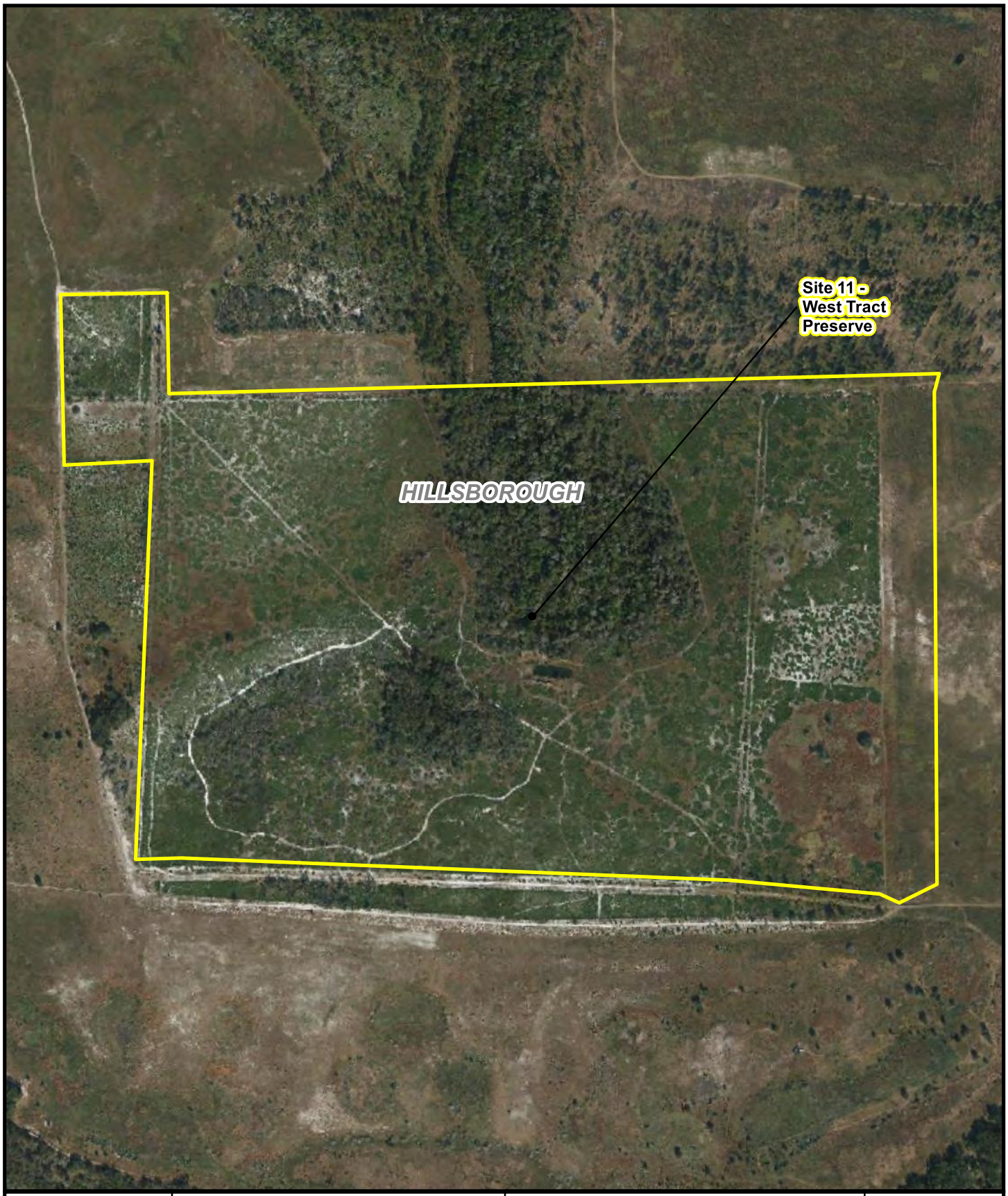
HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

Site Boundaries
County Lines
Mosaic Holdings

N
W E
S

FIGURE 6
SITE 4
ALTMAN TRACT

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 6.mxd



Feet
0 600
1 in = 600 feet

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FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

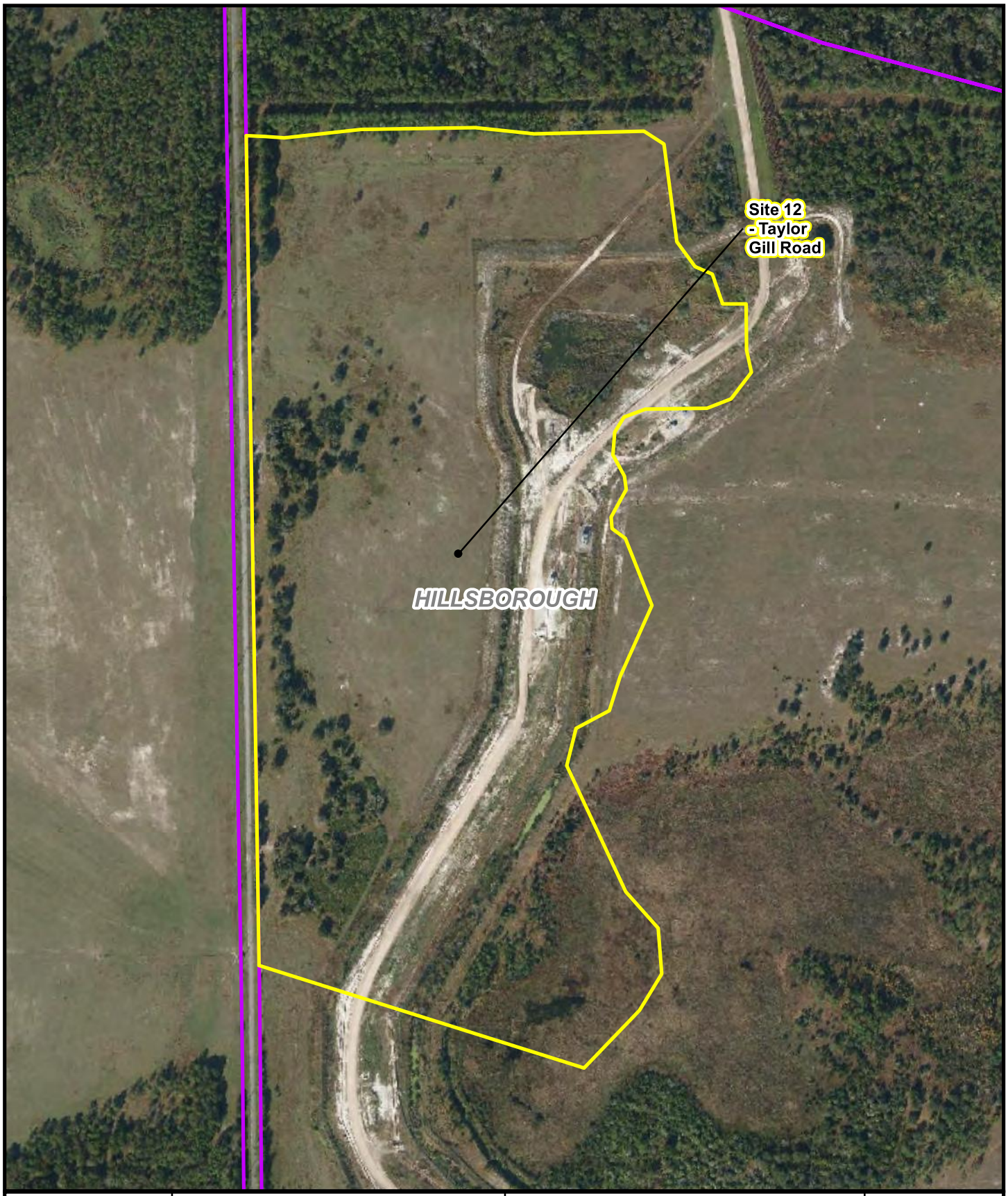
HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

Site Boundaries
County Lines
Mosaic Holdings

N
W E
S

FIGURE 7
SITE 11
WEST TRACT

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 7.mxd



Feet
0
400
1 in = 400 feet

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FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

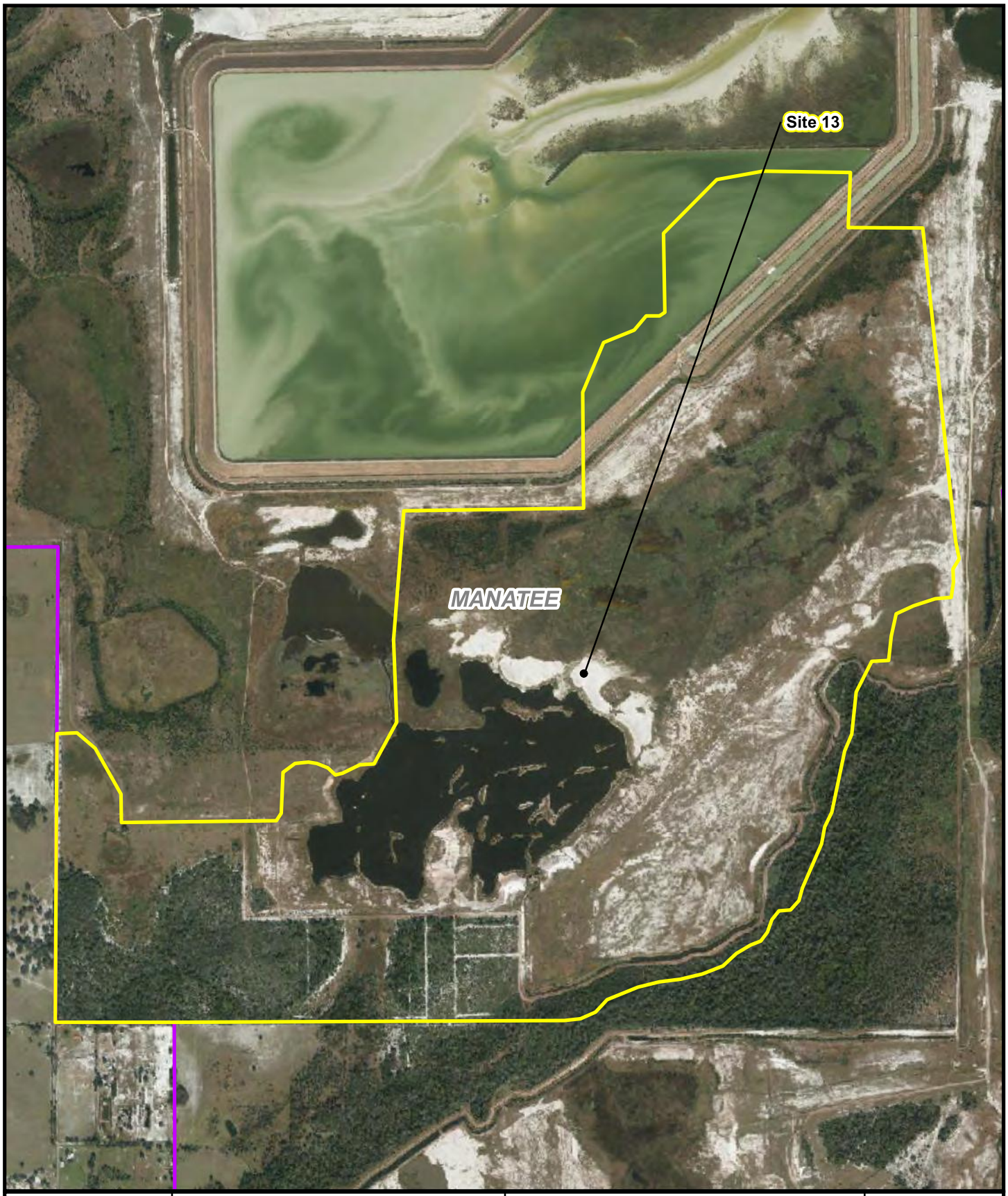
HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

Site Boundaries
County Lines
Mosaic Holdings

N
W E
S

FIGURE 8
SITE 12
TAYLOR GILL RD.

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 8.mxd



Feet
0 1,500
1 in = 1,500 feet

FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

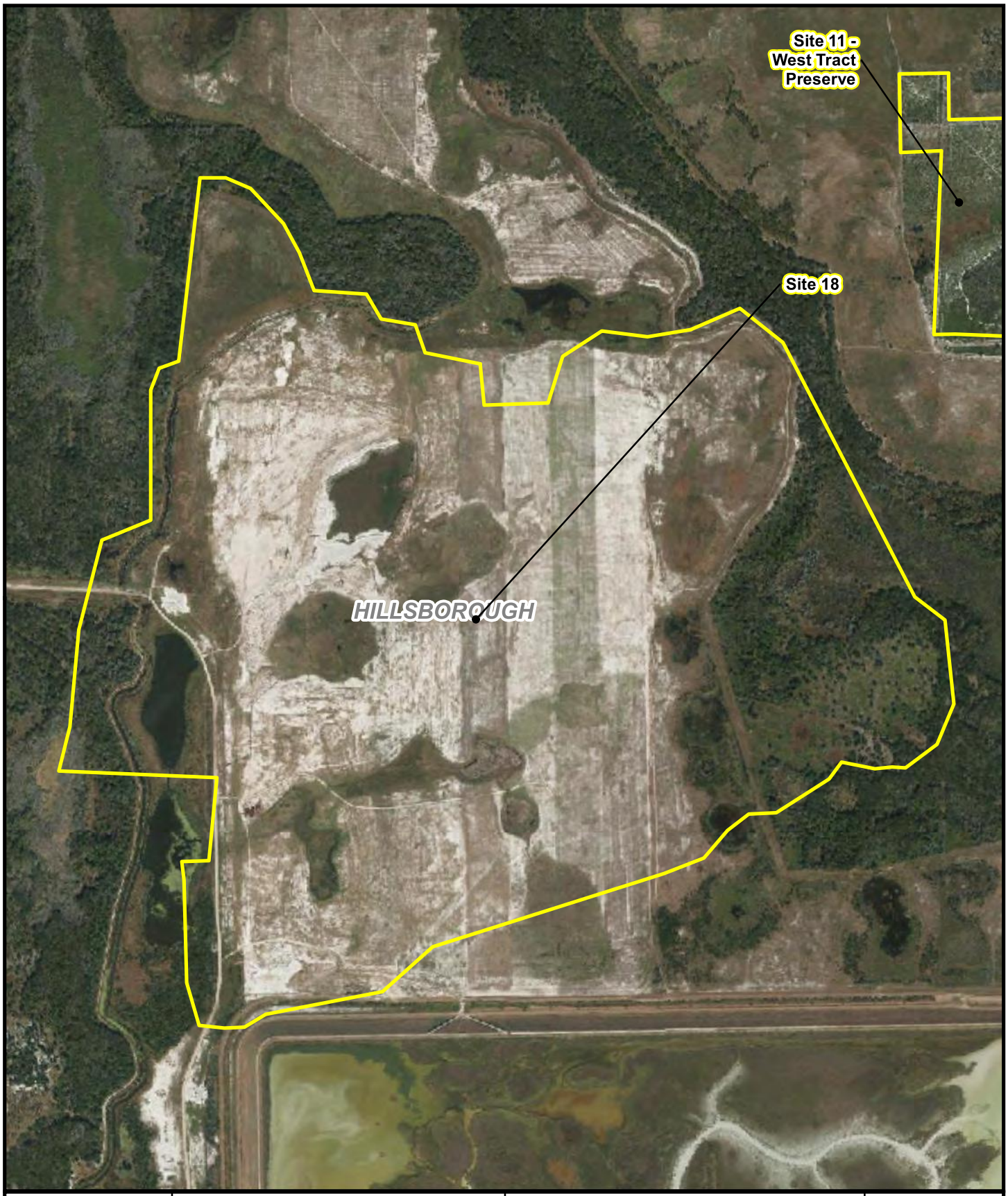
Site Boundaries
County Lines
Mosaic Holdings

N
W E
S

FIGURE 9
SITE 13

FLATWOODS Consulting Group

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 9.mxd



Feet
0 1,300
1 in = 1,300 feet

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FOUR CORNERS
LONESOME MINE
MOSAIC FERTILIZER LLC

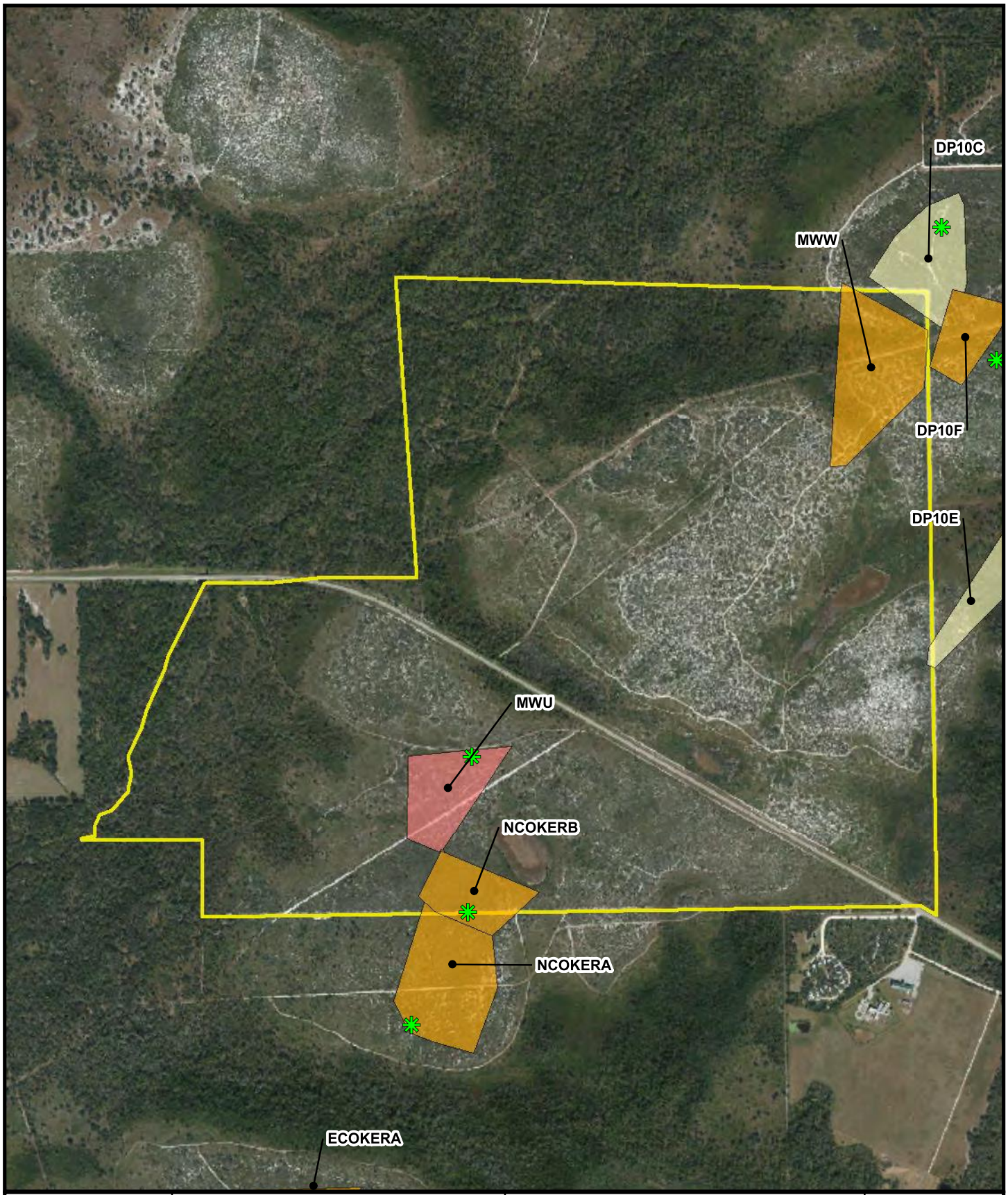
HARDEE, HILLSBOROUGH
MANATEE, AND POLK
COUNTIES, FLORIDA

Site Boundaries
County Lines
Mosaic Holdings

N
W E
S

FIGURE 10
SITE 18

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 10.mxd



Feet
0 1,400
1 in = 1,400 feet

WELLFIELD
FLORIDA SCRUB-JAY NEST & TERRITORY SURVEYS SPRING 2024
MOSAIC FERTILIZER LLC

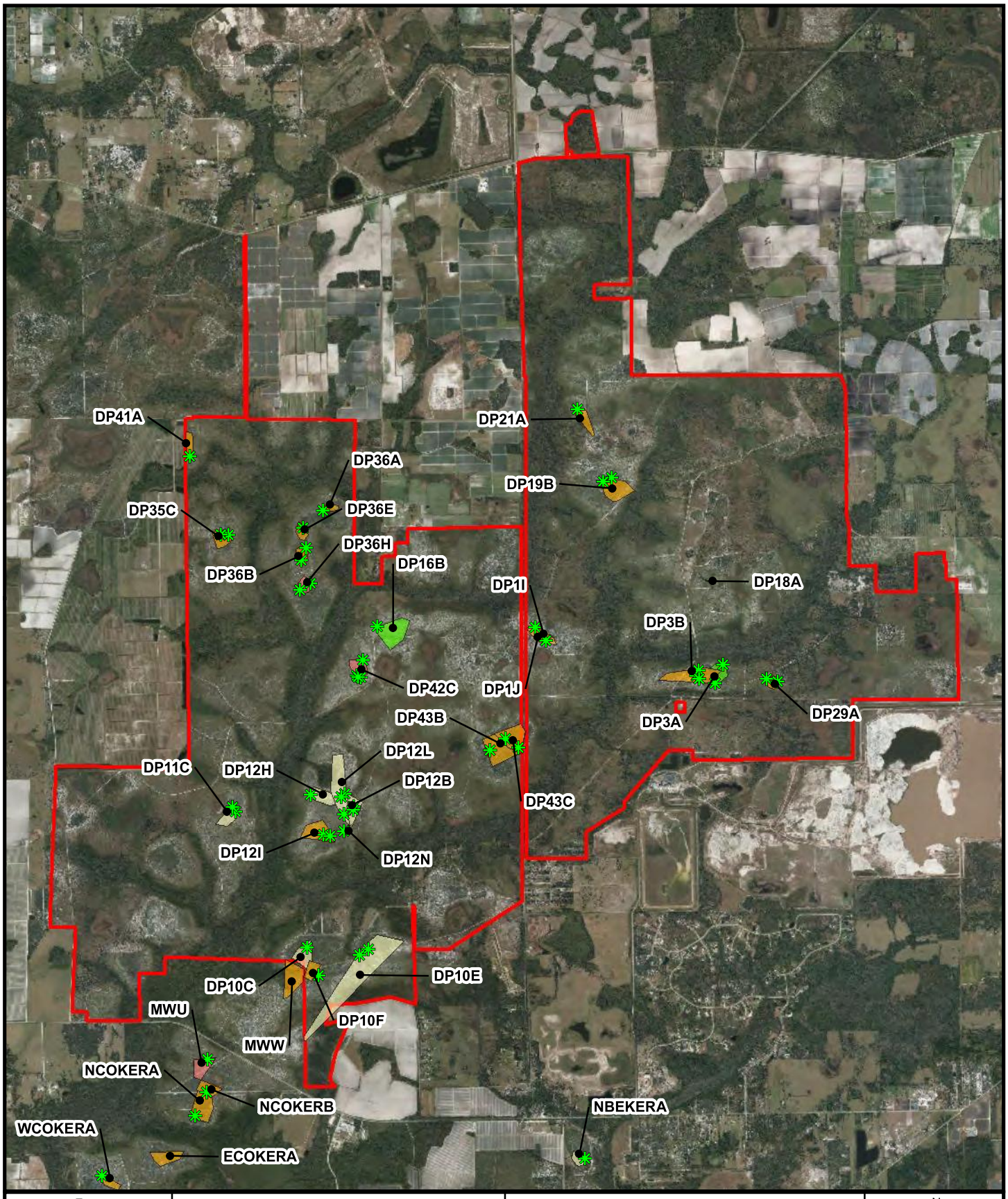
MANATEE COUNTY, FLORIDA

2024 Nest Location
Wellfield Boundary
Habitat Assessment
Mixed
Optimal
Short
Tall

N
W E
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FIGURE 11
QUALITATIVE HABITAT ASSESSMENT MAP

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 11.mxd



Feet
0 6,600
1 in = 6,600 feet

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DUETTE
FLORIDA SCRUB-JAY NEST & TERRITORY SURVEYS SPRING 2024
MOSAIC FERTILIZER LLC

MANATEE COUNTY, FLORIDA

2024 Nest Location

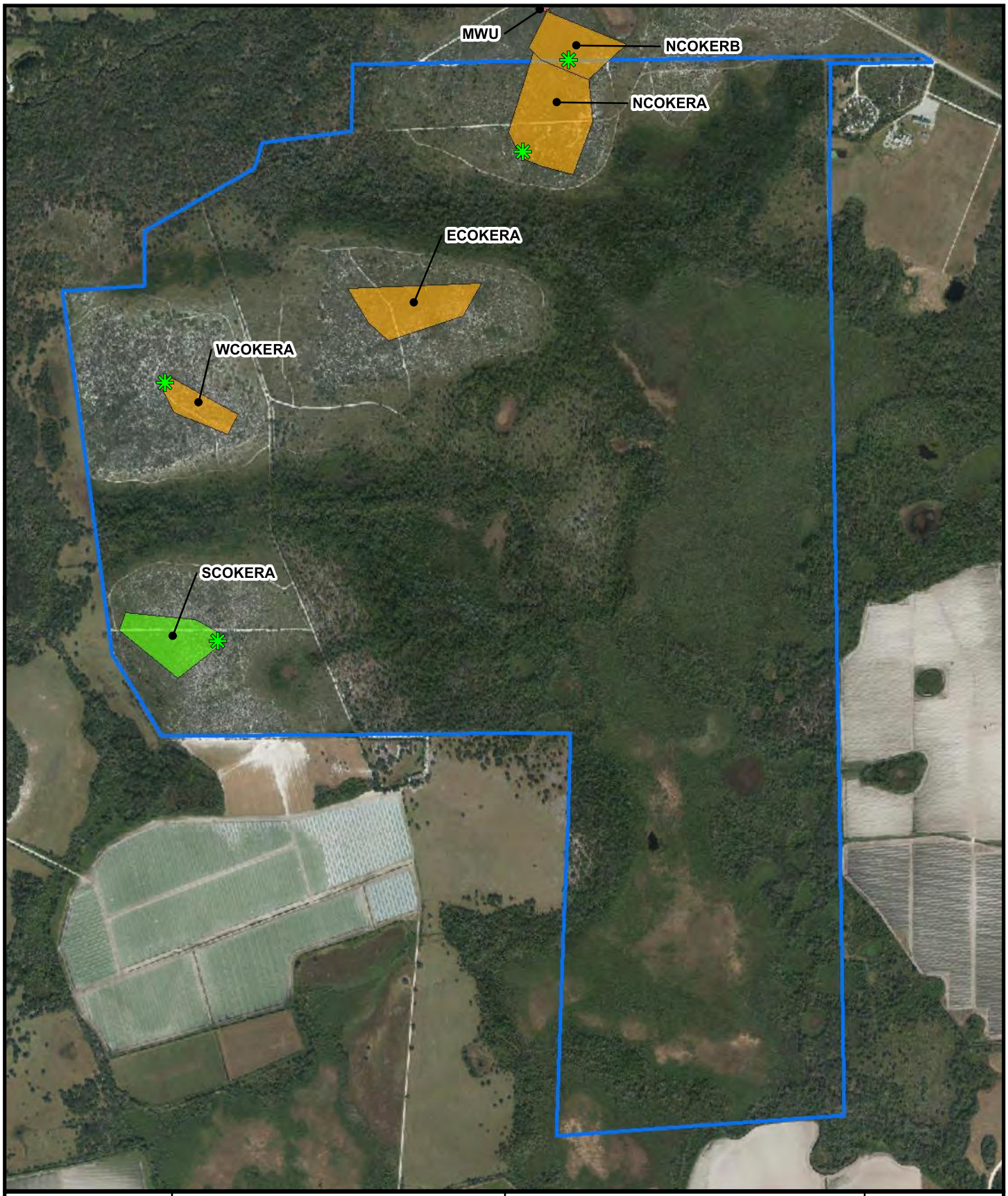
Habitat Assessment

Optimal
Short
Mixed
Tall

N
W E
S

FIGURE 12
QUALITATIVE HABITAT ASSESSMENT MAP

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 12.mxd



Feet
0
1,720
1 in = 1,700 feet

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DUETTE
FLORIDA SCRUB-JAY NEST & TERRITORY SURVEYS SPRING 2024
MOSAIC FERTILIZER LLC

MANATEE COUNTY, FLORIDA

Coker Creek Boundary
2024 Nest Location
Habitat Assessment
Mixed
Optimal
Short
Tall

N
W E
S

FIGURE 13
QUALITATIVE HABITAT ASSESSMENT MAP

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 13.mxd



Feet
0
1,200
1 in = 1,200 feet

FLATWOODS Consulting Group

WINGATE - BEKER STATE PARK
FLORIDA SCRUB-JAY NEST & TERRITORY SURVEYS SPRING 2024
MOSAIC FERTILIZER LLC

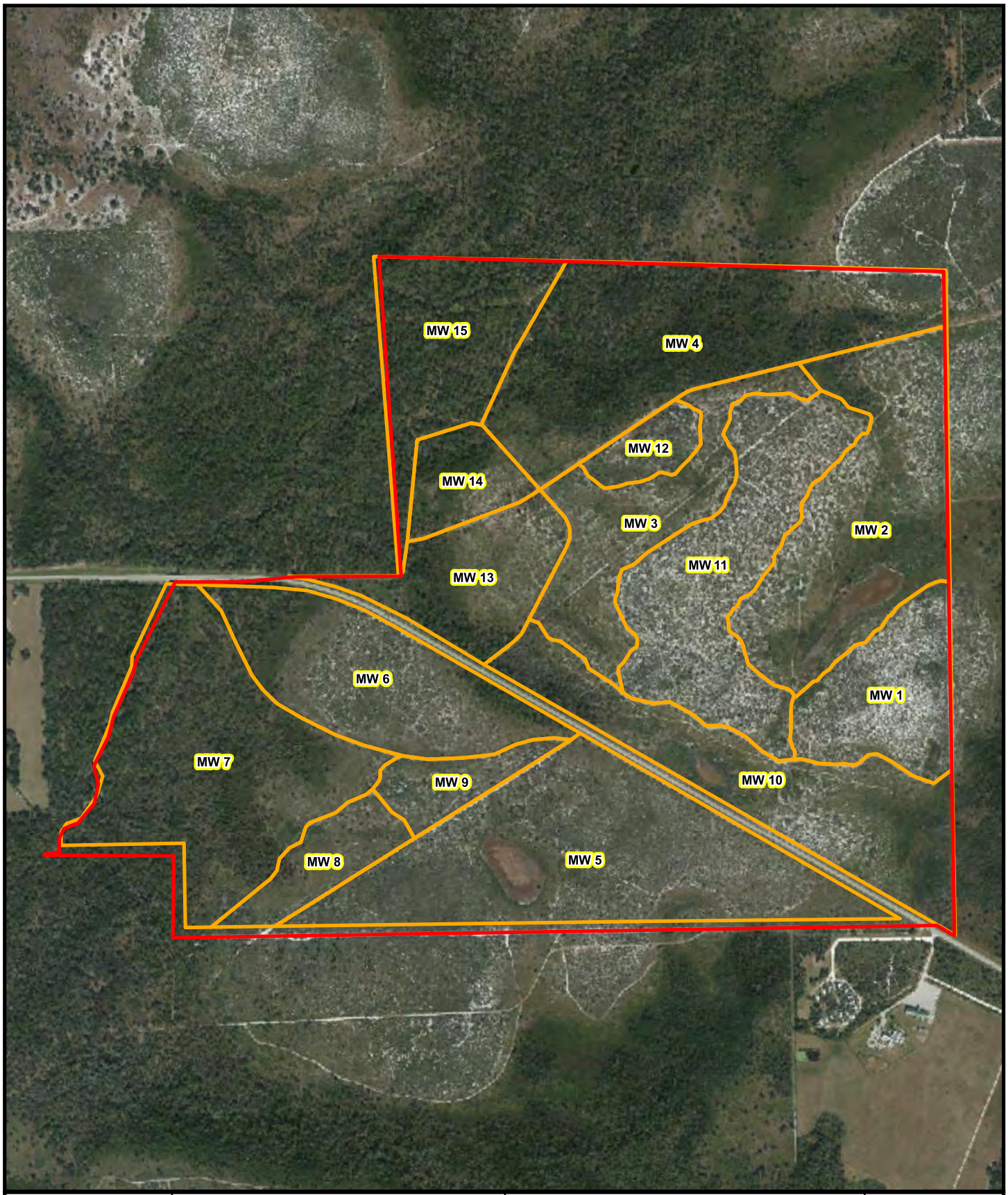
MANATEE COUNTY, FLORIDA

Wingate-Beker State Park
2024 Nest Location
Habitat Assessment
Mixed
Optimal
Short
Tall

N
W
E
S

FIGURE 14
QUALITATIVE HABITAT ASSESSMENT MAP

P:\0003MOS\117-FSJ Monitoring\GIS\FSJ FIGURE 14.mxd



Feet
0 1,300
1 in = 1,300 feet

MOSAIC WELLFIELD
FLORIDA SCRUB-JAY NEST & TERRITORY SURVEYS SPRING 2024
MOSAIC FERTILIZER LLC

MANATEE COUNTY, FLORIDA

Wellfield Boundary
Wellfield Burn Units

N
W E
S

FIGURE 15
WELLFIELD BURN UNITS

P:\0003MOS\117-FSJ Monitoring\GIS\FIGURE 15 WELLFIELD BURN UNITS.mxd

Tenth Annual Report

Mine-Wide 5-Year Permit (no. GTC-19-00286) and MOA



Mosaic Fertilizer, LLC

November 2024

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2 Gopher Tortoise Relocation Activities 3
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Appendix B – Surety Bond Continuation Certificate

Appendix C – TNC Annual Report

1 Introduction

Pursuant to the Restated and Amended Memorandum of Agreement Regarding Gopher Tortoises on Mosaic Land (MOA-dated June 18, 2015) and Gopher Tortoise Conservation Permit GTC-19-00286. Permit GTC-19-00286a represents the second 5-year permit issued in conjunction with the MOA, this was consequently amended for additional landscape 10/14/2022 and identified as Permit GTC-19-00286b, with further administrative amendments to extend the permit to 10/31/2024 (GTC-19-0286c, d, e & f). The original 5 -year permit was issued August 19, 2014. The following provides the results of the Tenth Annual Report. This Tenth Annual Report covers activities performed under Permit GTC-19-00286 related to gopher tortoises on Mosaic lands during the 5th year of the permit to the extended date of renewal (August 19, 2023 –October 31, 2024).

2 Gopher Tortoise Relocation Activities

2.1 After Action Reports

The required Florida Fish and Wildlife Conservation Commission (FWC) After-Action Reports for the past year have been entered electronically into Permit GTC-19-00286a and Permit GTC-19-00286b via the FWC on-line permitting portal and may be viewed there (per Section 16 of the MOA). No commensals were relocated to any of the permitted Recipient Sites. Any encountered commensals could exit the burrows on their own during gopher tortoise excavations or released on-site.

2.2 Donor and Recipient Sites Used

A list of all the donor sites from which gopher tortoises have been relocated during the fifth-year period may be found under the After-Action Reports tab of Permit GTC-19-00286a-f in the FWC on-line permitting portal. Information on adult and juvenile tortoise numbers and number of potentially occupied burrows on each donor site may also be found in the After-Action Reports. **Figure 1** shows the location of donor sites during the fifth year of the permit.

The Lykes Brothers Fisheating Creek Recipient Sites and Mosaic Wellfield North site were used during the Fifth -year period.

3 Summary of Monitoring Activities

Per Appendix 7 of the September 2012 Guidelines, the Mosaic Wellfield North, FG-HC-10/11/12 and the new Mosaic Wellfield South Recipient Sites are required to be monitored every three years for the first 15 years (triennial surveys). The first triennial surveys for Mosaic Wellfield North, FG-HC-10/11/12 recipient sites were conducted in July and August of 2017, and the

monitoring reports for both sites were submitted by 30th September 2017. As conditioned in the FWC issued permits for the Recipient Sites, the next Recipient Site surveys were conducted July 7, 2020 and September 16, 2020 and submitted to FWC. The next triennial reports will be due Sept 30th 2026 for Mosaic Wellfield North and FG-HC-10/11/12, and April 20th 2025 for the Mosaic Wellfield South.

Baseline surveys for Mosaic Wellfield North, FG-HC-10/11/12 were completed by Cardno Entrix ecologists on July 26, 2013 and July 29, 2013 respectively. Persons involved in original 2013 baseline surveys are included in **Table 1.** Mosaic Wellfield South Recipient Site persons involved in original baseline surveys conducted in 2021 have been amended to table 1.

Table 1: Baseline Survey Personnel

Recipient Site	Survey type	Persons conducting survey
Wellfield North	Baseline gopher tortoise survey	Michelle Curtis, Wesley Dillon, Winston Rutherford, and Richard Callahan III
Wellfield North	Baseline vegetation surveys	Winston Rutherford, Lance Arvidson, Megan Nistler, and Richard Callahan III
FG-HC 10/11/12	Baseline gopher tortoise survey	Andrew Fuddy, James Myers, Wesley Dillon, Winston Rutherford, and Richard Callahan III
FG-HC 10/11/12	Baseline vegetation surveys	Winston Rutherford and Richard Callahan III
Wellfield South	Baseline gopher tortoise survey	Alex Bockhorst, Thomas Burnett, Scott Donahue, Cole Fredricks, Matt Horrigan, Maya Hosabettu, Cuthbert Hutton, Riley Lund, Patrick Walter
Wellfield South	Baseline vegetation survey	Thomas Burnett, Matt Horrigan, Maya Hosabettu, Cuthbert Hutton, Patrick Walter

The baseline conditions were documented during the permitting process with FWC approved Habitat Management Plans (HMP) for all sites.

Mosaic submitted a permit application (#61297) for a new long-term protected recipient site (Wellfield South) on August 13, 2020. Mosaic has addressed all outstanding questions and provided all the necessary information for final permit issuance, and permit has been issued

January 31, 2022 (GTLR-22-00001). Neither the Wellfield South nor the FG-HC 10/11/12 recipient sites have been utilized. Mosaic is currently using the Wellfield North recipient site until capacity has been met.

4 Habitat Management Activities

4.1 FG-HC-10/11/12 Management

The FG-HC-10/11/12 gopher tortoise Habitat Management Plan (HMP) includes site management activities focused on sustaining and providing forage to support the gopher tortoise population relocated to the Recipient Site. The following provides a summary of the management activities conducted during the last permit year.

Multiple visits during early 2020, established concerns regarding cogon grass encroachment and scrub/scrubby flatwood shrub layer to allow recipient site to meet FWC vegetation standards. Starting in May of 2020 a program to reduce cogon grass on site was implemented. These actions included controlled fire (July 2nd, 2020) to reduce cover, followed by herbicide treatment 6-8 weeks post fire to kill cogan grass during post fire growth (15 Aug to 15 Sep 2020). Continuation of herbicide treatment occurred in November 2020, and again in May of 2021. This has reduced cogon cover to meet the expected <5% invasive requirement. A management program of increased fire frequency (~once every 2 years) and triannual herbicide treatment was implemented in the fall of 2021, and ongoing through 2022, with 3 treatments being conducted. A fire was planned for fall of 2022 but not completed due to fire bans. During 2023 reduction of pine canopy was conducted mechanically and burn preparation made for a late 2023 burn which was undertaken.

4.2 Wellfield North Management

The Mosaic Wellfield North HMP includes site management activities focused on sustaining and providing forage to support the gopher tortoise and scrub jay populations relocated to the Recipient Site. The following provides a summary of the management activities conducted during the last permit year.

Prescribed fire has been planned for the Wellfield North and South, but was unable to proceed due to very high fire danger and fire bans in the 2021 growing season, followed by rapid onset of the wet season. To make sure these sites can receive a burn for reduced height and canopy cover they will be implemented in the 2021 fall and winter. Ongoing, herbicide treatment occurs as any invasive is found, this approach allows an almost 0% probability of invasion. Most invasives are found along the access roads that are utilized by Manatee County management to reach the three well head pumping stations. Two prescribed burns were conducted on the North Wellfield covering 239 and 101 acres. Both fires conducted on the 6/29/2022 were relatively slow burning following some rain. Future fires will need to be hotter to be more

efficient at top kill of the scrub oak species reaching over 10ft in many places. May 17th 2023 an extensive fire was conducted on 430 acres of the North Wellfield. This was a very hot fire as intended and created extensive top kill on tall oaks. Additional height reduction of oaks was conducted mechanically.

4.3 Wellfield South Management

The Mosaic Wellfield South HMP is identical to the North HMP and includes site management activities focused on sustaining and providing forage to support the gopher tortoise and scrub jay populations relocated to the Recipient Site. During the last permit year along fire break roads herbicide treatments were conducted, with most occurring against the SR to the North and access road to the Manatee Well sites accessed by utility companies. Future management in 2023 will include replacement of the fence along SR 64 to comply with Gopher Tortoise permit needs, as well as conducting prescribed burn on approximately half the site. This burn was unable to be conducted in 2023 due to fire ban and is now planned for the growing season of 2024. Some mechanical treatment of large single oak trees was conducted in 2023 and and in 2024. Fire was not conducted in 2024 and is planned for 2025 growing season.

5 Summary of Mitigation Contributions

Section 16.d of the MOA requires a summary of the mitigation contributions paid for the year and an accounting of the gopher tortoises relocated. Section 10.c.i of the MOA requires Mosaic to pay up front the mitigation contribution per relocated gopher tortoise to The Wildlife Foundation of Florida. **Table 2** provides a summary of the mitigation contributions made and proposed to date. **Appendix A** provides a copy of last year's per tortoise mitigation contribution to the Wildlife Foundation of Florida.

Table 2: Gopher Tortoise Mitigation Contributions

Mitigation Contribution Period (August to August)	Mosaic Check #	Date	Amount
Year 1	193432	08/06/14	$90,000.00
	151723	03/04/15	$30,000.00
	153428	04/30/15	$90,000.00
Year 2	156908	09/08/15	$210,000.00
Year 3	166189	09/29/16	$60,000.00
Year 4	173617	10/5/17	$60,000.00

Year 5	179075	06/28/18	$60,000.00
Year 6	184733	05/10/19	$240,000.00
Year 7	192112	11/11/20	$180,000.00
Year 8	199911	10/27/2022	$35,000.00
Year 9	NA	NA	$0,00.00
Year 10	000456	11/14/2024	$75,000.00
		Total:	**$1,130,000.00**

Pursuant to a teleconference between Mosaic and FWC on Tuesday, September 23, 2015, money paid for relocation of juvenile gopher tortoises and for adult tortoises not relocated during the year can either be reimbursed to Mosaic or allowed to rollover to the next permit year. Mosaic continues to elect to rollover the amount of mitigation contributions from the third permit year and will continue to rollover surplus mitigation contribution fees. A summary of permit mitigation for the first 10 years is summarized in Table 3, and was emailed to FWC 11/19/2024.

Table 3: Tortoises relocated in first 10 years

MOA Year	Years	Permit	Mitigation Contribution	Permit Year	Adults	Non-hatchling Juveniles	Hatchlings	Totals
1	2014-15	GTC-14-00133	$ 300.00	1	492	73	5	570
2	2015-16	GTC-14-00133	$ 300.00	2	455	73	29	557
3	2016-17	GTC-14-00133	$ 300.00	3	256	28	2	286
4	2017-18	GTC-14-00133	$ 300.00	4	302	43	3	348
5	2018-19	GTC-14-00133	$ 300.00	5	553	33	0	586
6	2019-20	GTC-19-00286	$ 319.00	1	410	57	8	475
7	2020-21	GTC-19-00286	$ 319.00	2	239	48	53	340
8	2021-22	GTC-19-00286	$ 319.00	3	211	35	10	256
9	2022-23	GTC-19-00286	$ 319.00	4	90	4	1	95
10	2023-24	GTC-19-00286	$ 319.00	5	179	15	6	200
					3187	**409**	**117**	**3713**

TOTAL Adult Mitigation (Yr 1-5)	
$	617,400.00
TOTAL Adult Mitigation (Yr 6-10)	
$	360,151.00

Mosaic is also required to estimate the number of tortoises to be relocated during the next permit year and pay the corresponding mitigation contribution upfront. Based on the 5 year permit (GTC-24-00472) we would estimate 378 tortoises/year (1890/5) @351/tortoise = **$132,678**. A total of $977,551 in mitigation has been calculated in Table 3, that is matched by mitigation fees paid in the first 10 years of $1,130,000 (Table 2), including $75,000 just drawn and included in the attached documentation. A remaining amount of **$152,449 ($1,130,000-$977,551)** is still held by the Florida Foundation of Wildlife to be applied to the 11th year of the MOA, 1st year of the 3rd 5 year permit, and covers the expected $132,678 for relocation fees in year 1. Under the MOA Mosaic does not request reimbursement and all amounts roll-over to the next year and are added to accordingly.

6 Resource Management Support

Pursuant to Section 10.c.ii of the MOA, Mosaic provided the following non-charitable payments to The Nature Conservancy (TNC). Any future contributions may be paid to any other agreed-upon organization, for use in carrying out controlled burns or other gopher tortoise habitat management activities on public and/or private lands in Florida. Such funding shall total at least $1.8 million for the 30-year life of this MOA, provided as $60,000 annually. Table 4 provides a summary of the funding provided to TNC. A contribution of $120,000 for the years of 2024 and 2025 was paid 10/21/2024. Work completed by TNC is detailed in accompanying report.

Table 4: Non-Charitable Resource Management Support

Mosaic Check #	Date	Amount
192174	05/13/14	$60,000.00
195383	12/16/14	$60,000.00
150542	01/22/15	$60,000.00
160847	02/09/16	$60,000.00
169420	02/28/17	$60,000.00
177101	03/23/18	$60,000.00
183363	03/07/19	$60,000.00
188779	03/11/20	$60,000.00
194009	06/22/21	$60,000.00
202562	07/25/23	$120,000.00
000403	10/21/2024	$120,000.00
	Total:	$880,000.00

7 Surety Bond Renewal / Adjustments

On August 5, 2014 a long-term bond (Bond #82382100) for $966,000.00 was set up for the Mosaic Wellfield North Gopher Tortoise Recipient Site and the FG-HC 10/11/12 Gopher Tortoise Recipient Site. On March 19, 2015, a rider was established to amend Bond #82382100 to include the two Mosaic historic gopher tortoise recipient sites FCL-NFM-1 and FG-HC-3/5, bringing the bond to a total of $1,642,070.00. On December 30th, 2022 an additional rider was established for inclusion of the Mosaic Wellfield South Gopher Tortoise Recipient Site, and amended Bond #82382100 to $2,316,070.00. This bond is automatically renewed on an annual basis as shown by the Continuation Certificate **(see Appendix B)**. There is no bond adjustment planned for this next year.

8 Unanticipated Relocations

Table 5 provides a summary of the Unanticipated Relocations by type (i.e. Prior Noticed Unanticipated Relocations and Post Notification Relocations).

Table 5: Year 10 (Year 5 of Permit GTC-19-00286): August 19, 2023, through October 30, 2024

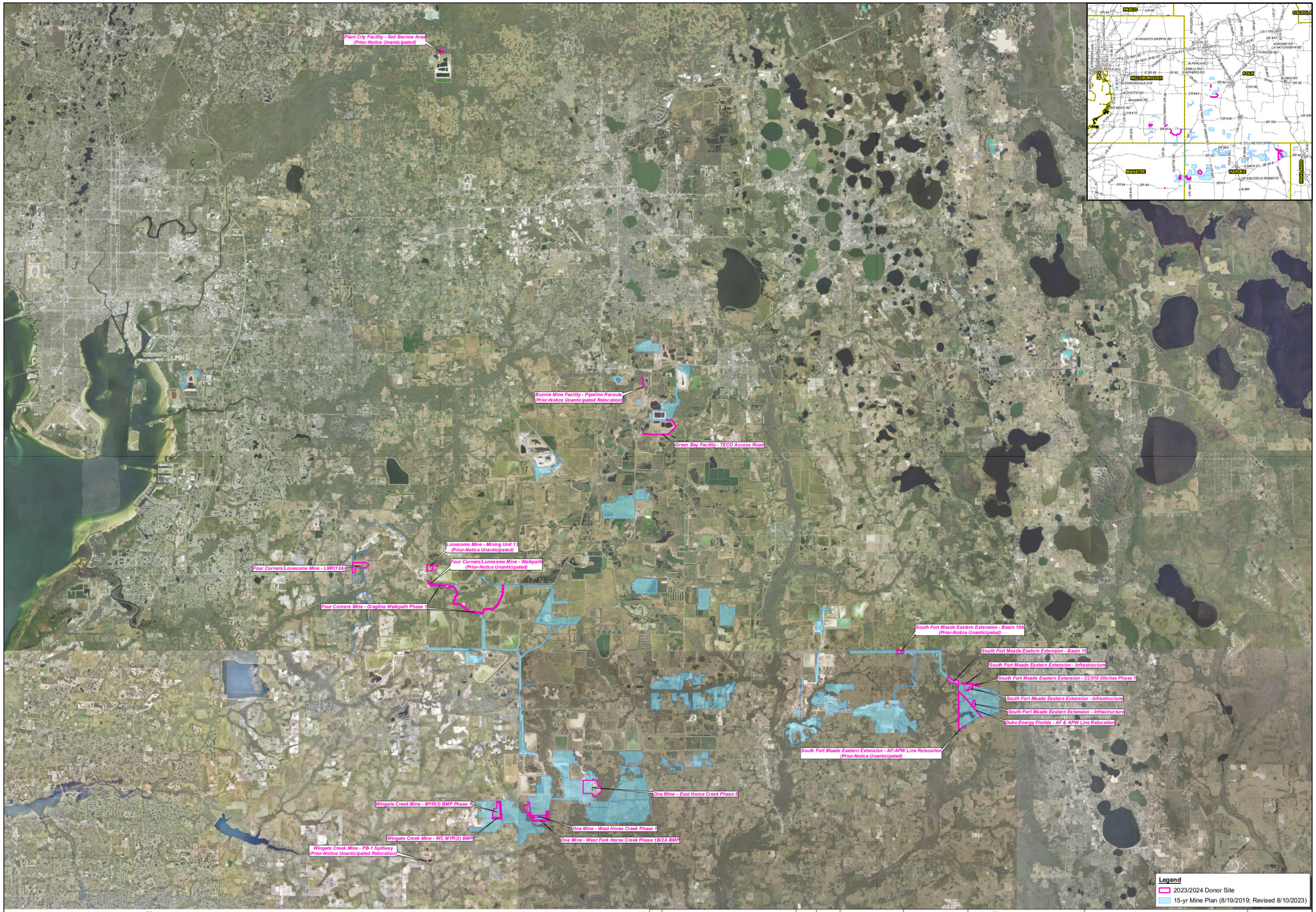
Year 10 Prior-Notice and Post-Notice Unanticipated Relocations: 8/19/23 – 10/30/24				
Donor Site	**Post-Notice or Prior-Notice Unanticipated Relocation**	**# Tortoises ≥130 mm Relocated**	**# Juvenile Tortoises <130 mm Relocated**	**Date GT Relocation Completed**
Four Corners/Lonesome Mine - Walkpath	Prior-Notice	2	0	9/8/2023
Plant City Facility - Soil Borrow Area	Prior-Notice	6	0	10/27/2023
Lonesome Mine - Mining Unit 13	Prior-Notice	6	1	11/10/2023
South Fort Meade Eastern Extension - AF/APW Line Relocation	Prior-Notice	2	2	11/13/2023
Wingate Creek Mine - PB-1 Spillway	Prior-Notice	3	0	11/22/2023
South Fort Meade Eastern Extension - Basin 10A	Prior-Notice	7	0	12/8/2023
Bonnie Mine Facility - Pipeline Reroute	Prior-Notice	10	3	6/3/2024
Year 9 Prior-Notice Unanticipated Relocations TOTAL		**36**	**6**	
Year 9 Post-Notice Unanticipated Relocations TOTAL		**0**	**0**	

Tortoises Relocated: Year 10 (Year 5 of Permit GTC-19-00286)*			
	Fisheating Creek recipient site	**Mosaic Wellfield North**	**Total**
Adult tortoises (≥130 mm) relocated	144	35	179
Non-hatchling juvenile tortoises (61-129 mm) relocated	14	1	15
Hatchling tortoises (≤60 mm) relocated	6	0	6
Year 10 Relocations for GTC-19-00286 TOTAL	**164**	**36**	**200**

**including post-notice and prior-notice unanticipated relocations*

Figure 1:

Donor Site Location Map



N
W E
S

9,000 4,500 0 9,000 Feet

1 inch = 9,000 feet

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, express or implied, as to accuracy, completeness, or timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction document. The use or misuse of the information contained on this document is at the sole risk of the party using or misusing the information.

Source: World Imagery obtained from ESRI Basemap. Image origin: State of Florida. Dates: 11/6/2023, 2/28/2023, 3/13/2023, & 11/19/2023.

NO.	REVISION	BY	DATE
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FOR REDUCED PLANS: ORIGINAL IN INCHES
0 0.5 1.0 1.5 2.0

DESIGNED BY:
DRAWN BY: NL
CHECKED BY: CEF

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PROJ NO: 243002594.01A
FILE: 24-1104_Mosaic GT AR.aprx

Donor Site Location Map

Mosaic Fertilizer, LLC
Gopher Tortoise Annual Report
DeSoto, Hardee, Hillsborough, Manatee, and Polk Counties, Florida

DATE: 11/4/2024
SCALE: 1:108,000
FIGURE: 1

Document Path: I:\projects\243002594.01A\GIS\MXD\AR\24-1104_Mosaic GT Survey and Plant Sources FIGURE2_AR1819-2023 REV24-1104_Mosaic GT AR.aprx Printed: 11/4/2024, 11:55 AM, Kleinfelder

Appendix A

Year 10 for Year 11 Mitigation Contribution / Check Copy

Mosaic

No. 000403

Date: 10/31/2024 Vendor Name : NATURE CONSERVANCY Vendor Number: NATU2-0000

Document	Your Document	Date	Deductions	Gross Amount
396251	SPHKV2507876	10/31/2024	0.00	120,000.00
Sum Total			**0.00**	**120,000.00**

Mosaic

Mosaic Global Sales LLC
13830 Circa Crossing Drive
Lithia FL 33547 US

Wells Fargo Bank, N.A.
115 Hospital Drive
Van Wert, OH 45891

000403

041203824

9637481848

Date: 10/31/2024

Pay : ONE HUNDRED TWENTY THOUSAND DOLLARS AND 00/100 $**********120,000.00*

To the Order of NATURE CONSERVANCY
1101 W RIVER PKWY - STE 200
MINNEAPOLIS MN 55415

Memo

⑈000403⑈ ⑆041203824⑆ 9637481848⑈

Security features. Details on back.

Appendix B

Surety Bond Continuation Certificate

ORIGIN ID:CHIA (312) 381-4583
ROGER PARAISON
AON CORPORATION
200 E RANDOLPH ST

CHICAGO, IL 60601
UNITED STATES US

SHIP DATE: 04NOV24
ACTWGT: 0.06 LB
CAD: 252419361/WSXI3300
DIMS: 11x6x1 IN

BILL SENDER

TO **DARREN CLARK**
MOSAIC
3033 CAMPUS DR STE W400

PLYMOUTH MN 55441
(763) 577-2799 REF:
INV:
PO: DEPT:

598CJ4/E74C/C6C4

FedEx Express

REL#
3785346

TUE - 05 NOV 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **2814 0961 8521**

XS AELA

55441
MN-US **MSP**

Fold Here - Please fold or cut in half

CONTINUATION CERTIFICATE

FEDERAL INSURANCE COMPANY , Surety upon

a certain Bond No. 82382100

dated effective 8/05/2015
(MONTH-DAY-YEAR)

on behalf of MOSAIC FERTILIZER, LLC
(PRINCIPAL)

and in favor of FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on August 5, 2024
(MONTH-DAY-YEAR)

and ending on August 5, 2025
(MONTH-DAY-YEAR)

Amount of bond $2,316,070.00

Description of bond Gopher Tortoise Recipient Site Habitat Management Obligations

Premium: $ 7,527.00

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on November 4, 2024
(MONTH-DAY-YEAR)

FEDERAL INSURANCE COMPANY

By _____

ATTORNEY-IN-FACT Roger Paraison

CHUBB

Power of Attorney

Federal Insurance Company | Vigilant Insurance Company | Pacific Indemnity Company
Westchester Fire Insurance Company | ACE American Insurance Company

Know All by These Presents, that **FEDERAL INSURANCE COMPANY**, an Indiana corporation, **VIGILANT INSURANCE COMPANY**, a New York corporation, **PACIFIC INDEMNITY COMPANY**, a Delaware corporation, **WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY** corporations of the Commonwealth of Pennsylvania, do each hereby constitute and appoint; Richard Casas, Corinne Chapman, Samantha Chierici, Jessica B. Dempsey, George F. Douaire V Derek J. Elston, Kristin L Hannigan, Therese M. Jackson, Jennifer L. Jakaitis, Nicholas Kertesz, Judith A. Lucky-Eftimov, Tara A. Maquinto, James B. McTaggart, Robert Nachreiner, Nicholas Pantazis, Roger Paraison, Christina L. Sandoval, Bartlomiej Siepierski, Jean Torres, Christopher P. Troha, Aerie Walton, Susan A. Welsh, Sandra M. Winsted and Dartonya Wright of Chicago, Illinois ----------

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, PACIFIC INDEMNITY COMPANY, WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY** have each executed and attested these presents and affixed their corporate seals on this **1st** day of **August 2024.**

Rupert HD Swindells, Assistant Secretary

Warren Eichhorn, Vice President

STATE OF NEW JERSEY
County of Hunterdon SS.

On this **1st** day of **August, 2024** before me, a Notary Public of New Jersey, personally came Rupert HD Swindells and Warren Eichhorn, to me known to be Assistant Secretary and Vice President, respectively, of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, PACIFIC INDEMNITY COMPANY, WESTCHESTER FIRE INSURANCE COMPANY and ACE AMERICAN INSURANCE COMPANY, the companies which executed the foregoing Power of Attorney, and the said Rupert HD Swindells and Warren Eichhorn, being by me duly sworn, severally and each for himself did depose and say that they are Assistant Secretary and Vice President, respectively, of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, PACIFIC INDEMNITY COMPANY, WESTCHESTER FIRE INSURANCE COMPANY and ACE AMERICAN INSURANCE COMPANY and know the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of said Companies; and that their signatures as such officers were duly affixed and subscribed by like authority.

Notarial Seal

Albert Contursi
NOTARY PUBLIC OF NEW JERSEY
No 50202369
Commission Expires August 22,2027

Notary Public

CERTIFICATION

Resolutions adopted by the Boards of Directors of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY on August 30, 2016; WESTCHESTER FIRE INSURANCE COMPANY on December 11, 2006; and ACE AMERICAN INSURANCE COMPANY on March 20, 2009:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into in the ordinary course of business (each a "Written Commitment"):

(1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.

(2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such person's written appointment as such attorney-in-fact.

(3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(4) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing to any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested."

I, Rupert HD Swindells, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, PACIFIC INDEMNITY COMPANY, WESTCHESTER FIRE INSURANCE COMPANY and ACE AMERICAN INSURANCE COMPANY (the "Companies") do hereby certify that

(i) the foregoing Resolutions adopted by the Board of Directors of the Companies are true, correct and in full force and effect,
(ii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Whitehouse Station, NJ, this 4th day of November, 2024.

Rupert HD Swindells, Assistant Secretary

IN THE EVENT YOU WISH TO VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT:
Telephone (908) 903-3493 Fax (908) 903-3656 e-mail: surety@chubb.com

Appendix C

The Nature Conservancy Annual Report of use of Non-Charitable Resource Management Support



2024 Gopher Tortoise Habitat Restoration and Management Activities
Report Prepared for The Mosaic Company
Submitted February 2025 by The Nature Conservancy

Background

From 2014 through 2025, The Mosaic Company has made $780,000 in financial payments, typically $60,000 annually, to support The Nature Conservancy (TNC) in Florida's gopher tortoise habitat restoration and management work. These payments are related to The Mosaic Company's 30-year agreement with the Florida Fish and Wildlife Conservation Commission, which includes financially supporting gopher tortoise habitat management work. This partnership document provides additional details.

Habitat Restoration and Management

TNC is the world's largest, most effective conservation organization, with staff in 79 countries and all 50 U.S. states. TNC is focused on two major crises: halting biodiversity loss and tackling climate change.

In Florida, TNC's land stewardship efforts, which include gopher tortoise habitat restoration and management activities — generously supported by The Mosaic Company — work to preserve Florida's unique biodiversity. TNC does this work on lands managed by public and private conservation partners as well as on properties it owns and operates, namely, TNC's Florida preserves. Regarding the latter, TNC in Florida's Tiger Creek Preserve (TCP) and

Apalachicola Bluffs and Ravines Preserve (ABRP) provide vital habitat for the gopher tortoise. Both preserves are home to a large variety of rare and endangered plant and animal species.

TCP's 4,980 acres of habitat sits on the eastern edge of Lake Wales Ridge, peninsular Florida's oldest and highest landmass—an ancient island that started forming millions of years ago when most of Florida was underwater. The topographical area contains among the highest concentrations of rare animals and plants in the U.S. Some exist nowhere else on Earth.

ABRP encompasses 6,430 acres of habitat. Located in Florida's eastern panhandle, it is in the center of one of five TNC-identified biodiversity hotspots in North America, providing a vital refuge for rare and imperiled flora and fauna.

Techniques utilized to preserve and enhance habitat for the gopher tortoise and other species, include prescribed fire, invasive species control, and restoration of longleaf pine trees and associated groundcover plants. Gopher tortoise habitat in Florida is fire dependent. Additionally, like most Florida habitats, the upland habitats that support the gopher tortoise are negatively impacted by non-native invasive species infestations. TNC in Florida utilizes active restoration measures, including tree planting and native groundcover reestablishment, to restore degraded habitats.

A Keystone Species
Designated as threatened by the state of Florida, the gopher tortoise is recognized as a keystone species, one that contributes an outsized impact for the environment. This impact is mostly due to their extraordinary burrows, which can extend up to 40 feet long and 10 feet wide. Their burrows provide shelter for hundreds of other rare and iconic animals, including the eastern indigo snake, gopher frog, Florida mouse, and many other reptiles and small mammals. Many of these species would not survive without gopher tortoises.

Gopher tortoise populations have declined 80% in the last 100 years and further population decreases are predicted due to habitat fragmentation and human development.

Thanks to partners like The Mosaic Company, TNC in Florida is actively restoring and protecting the longleaf pine, scrub, pine flatwoods and other habitats that the gopher tortoise needs to survive.



Prescribed fire is critical to TNC's gopher tortoise habitat restoration and management work.
© David Printiss/TNC

2024 Gopher Tortoise Habitat Restoration and Management Activities
Financial support from The Mosaic Company and other partners helped TNC in Florida conduct the following gopher tortoise habitat restoration and management activities in 2024:

- Led or partnered on **87 controlled burns** comprising 93,945 acres at 19 unique sites, working with nine partners. An estimated 69,945 of these acres are current or potential gopher tortoise habitat.
- Surveyed and treated over **8,028 acres of invasive plants** that negatively impact gopher tortoise habitat.
- Completed **185 acres of longleaf pine planting and 575 acres of native groundcover** restoration that support gopher tortoise habitat; and collected **7,800 pounds of wiregrass seed** from Torreya State Park in North Florida for future restoration projects in the eastern panhandle.
- Improved firebreaks on TNC's fire-maintained preserves in Florida through **55 workdays**.
- As part of TNC in Florida's work with partners, **TNC assisted Archbold Biological Station** with eight controlled burns totaling 638 acres. TNC in Florida continued to support Dr. Joshua Daskin, director of conservation for Archbold Biological Station, in developing a new ecosystem restoration team focused on south-central Florida. The Archbold Team secured funding and is in the process of hiring fire crew members for this new team as of December 2024.

Gopher Tortoise Sightings and Successes
Thanks to healthy natural habitat at TCP and ABRP — the product of regular prescribed burns, restoration and invasive plant management — TNC staff and visitors enjoy occasional sightings of gopher tortoise, which are known for being timid and elusive.

"We always look forward to the post-burn evaluation monitoring, because after fire, the gopher tortoise burrows really stand out," says Cheryl Millett, preserve manager at TCP. "It's then that we see the most tortoises, since the burrows aren't obscured by vegetation and because the tortoises use that opportunity to clean house and spray fresh dirt to the apron at the mouth of the burrows."


TNC staff at Tiger Creek Preserve (TCP) recently spotted this baby gopher tortoise. © Cheryl Millett/TNC

According to Catherine Ricketts, preserve manager at ABRP, gopher tortoise sightings are infrequent at the preserve, but fresh burrows provide evidence of a healthy population. "In 2024, during our ongoing indigo snake monitoring effort, the Orianne Center for Indigo Conservation and TNC's ABRP staff tracked more than 1,000 gopher tortoise burrows at ABRP, over 600 of which showed signs of current gopher tortoise activity," she says. Though tortoises are rarely seen, they leave behind tracks at their burrow entrances and clear evidence of excavation. Thanks to grant and partner funding, game cameras established at ABRP to monitor eastern indigo snake activity also capture juvenile tortoises moving across the landscape.

A healthy eastern indigo snake population at ABRP is also an indicator of gopher tortoise well-being. The snakes rely on gopher tortoise burrows for shelter. In late-2023, ABRP staff observed two wild-born eastern indigo snake hatchlings — the first wild-born hatchlings at the preserve in more than 40 years. Their presence is a promising sign that TNC's habitat restoration and management at ABRP is creating and maintaining a landscape that can support the gopher tortoise and the federally threatened apex predator (indigo snake) that relies on it.

Prescribed Fire Trainings
TNC in Florida remains committed to equipping future generations with the knowledge and skills to steward the land, which includes performing prescribed burns. Controlled burns are especially vital to maintaining healthy habitat in Florida. Nearly all of the state's 10 million acres of conserved land depend on fire directly or indirectly to maintain its diversity of plant and animal life, including the gopher tortoise, eastern indigo snake, Florida panther, Florida scrub jay, red-cockaded woodpecker and burrowing owl. During a fire, the gopher tortoise burrow plays a key role, providing a safe refuge for reptiles, amphibians, mammals and insects alike.

In 2024, TNC trained 58 fire students through eight trainings. Participant and partner groups included the U.S. Fish and Wildlife Service, National Park Service, Florida Park Service, Florida Forest Service, University of Idaho Student Association for Fire Ecology, University of South Florida, Fire Forward, Tall Timbers Research Station, and seven TNC chapters other than Florida.

Funds Leveraged
The Mosaic Company's investment helped TNC leverage additional funds for its life-saving habitat restoration and management work. Select 2024 funding accomplishments include:

- The National Fish and Wildlife Foundation's Longleaf Landscape Stewardship Fund awarded TNC a **$2 million, four-year grant** to restore longleaf pine habitat on public and private lands within the eastern panhandle and central peninsula of Florida and southwest Georgia, benefitting at-risk species like the gopher tortoise, eastern indigo snake, and Bachman's sparrow. The project will plant over 5,000 acres of longleaf pine, improve 30,000 acres of existing longleaf pine by removing competing hardwood trees and prescribed burning, and protect 1,000 acres of private longleaf pine habitat with voluntary conservation easements via a subaward to Tall Timbers Research Station.
- The U.S. Department of Agriculture's Landscape Scale Restoration Program awarded TNC a **$300,000, five-year grant** to restore longleaf pine habitat on non-federal public and private land in the eastern panhandle. The project will support 18,000 acres of prescribed fire, 610 acres of longleaf pine planting, and 110 acres of invasive species control.
- The U.S. Fish and Wildlife Service awarded TNC **$367,220** for wiregrass seed collection equipment, supplies, and infrastructure for seed storage at Apalachicola Bluffs and Ravines Preserve (ABRP).



TNC conservation steward Lydia Engh prepares for the annual wiregrass harvest at TNC's preserve in North Florida. © Brad Keegan

Thank You
The Mosaic Company's generous support fuels the life-giving prescribed fires and other restorative land management practices that conserve habitat in Florida for the gopher tortoise and so many other rare plants and animals. We are grateful for your partnership and commitment to this critical work, which is key to protecting and maintaining Florida's unique biodiversity.

We respectfully invite The Mosaic Company to consider visiting ABRP in November 2025 for a tour of the preserve and to witness the annual wiregrass seed harvest/planting, which is a fascinating process and important to our ongoing restoration of gopher tortoise habitat. Alternately, the annual eastern indigo snake release at ABRP is scheduled for April 29, 2025, and would also make for an interesting visit to the preserve. Please reach out directly to Neal Robinson, senior associate director of philanthropy for corporate and foundation relations, at Neal.Robinson@tnc.org if you would like to discuss these on-site opportunities or others.

We look forward to our continued partnership and to all we will accomplish together in the future.



MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
DESOTO, HARDEE, HILLSBOROUGH, MANATEE, PASCO AND POLK COUNTIES, FLORIDA
KLEINFELDER PROJECT #25002781.001A

FEBRUARY 2025

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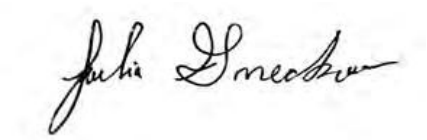
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A Report Prepared for:

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MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
DESOTO, HARDEE, HILLSBOROUGH, MANATEE, PASCO AND POLK COUNTIES, FLORIDA

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A Photographic Documentation

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MOSAIC FERTILIZER, LLC

2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY

DESOTO, HARDEE, HILLSBOROUGH, MANATEE, PASCO AND POLK COUNTIES, FLORIDA

1 EXECUTIVE SUMMARY

Kleinfelder conducted an aerial bald eagle (*Haliaeetus leucocephalus*) nest activity status survey on February 11, 2025, within portions of the approximately 369,718-acre Mosaic Fertilizer, LLC holdings in DeSoto, Hardee, Hillsborough, Manatee, Pasco and Polk Counties. A total of 99 bald eagle nest locations were surveyed including 36 active nests, 16 inactive nests, 44 unobserved nest locations, and three nests occupied by great horned owls (*Bubo virginianus*). A detailed discussion of the methodologies used, and results is presented here in.

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2 INTRODUCTION

In support of Mosaic Fertilizer, LLC's (Mosaic) Avian Protection Plan, Kleinfelder ecologists conducted an aerial bald eagle (*Haliaeetus leucocephalus*) nest activity status survey within portions of the approximately 369,718-acre Mosaic Fertilizer, LLC land holdings in DeSoto, Hardee, Hillsborough, Manatee, Pasco and Polk Counties (**Figure 1**). Kleinfelder ecologists followed a general survey route designed to sample known and historic bald eagle nest locations within approximately one mile of Mosaic holdings (**Figure 2**). This report represents the results of the survey conducted on February 11, 2025.

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3 METHODOLOGY

3.1 REGULATORY AND DATABASE REVIEW

A review of available literature and Florida Fish and Wildlife Conservation Commission (FWC) databases for documented occurrences of bald eagle nests located on or in close proximity (approximately one mile) to Mosaic holdings was conducted on February 10, 2025, and included the following sources:

- FWC Eagle Nesting GIS Shapefile (FWC 2017b), and
- Audubon Eagle Watch Public View Nest Location Map v2 (Audubon 2024).

3.2 BALD EAGLE NEST ACTIVITY STATUS SURVEY FIELD PROTOCOL

Known and historic bald eagle nest sites located on or in close proximity to Mosaic holdings were surveyed by helicopter. Kleinfelder ecologists observed and photographed each nest using a high-resolution camera equipped with significant optical and digital zoom (Canon image stabilized EF 100-400mm f/4.5-5.6L IS USM lens). Each nest was assigned an activity status based on the FWC Species Action Plan for the Bald Eagle (FWC 2017a).

Active Nest – a nest that shows or showed evidence of breeding by bald eagles, such as an adult attending the nest or in incubating position, a clutch of eggs, or a brood of nestlings, at any time during the current or most recent nesting season.

Inactive Nest – a bald eagle nest that does not show evidence of breeding by bald eagles during the current or most recent nesting season. This classification includes nests occupied by osprey (*Pandion haliaetus*).

GHOW – a nest occupied by great horned owls (*Bubo virginianus*) at the time of the survey.

Unobserved Nest – a bald eagle nest that is no longer present or intact due to natural causes (e.g., fell apart or was blown out of a tree). In some cases, the nest tree itself may be lost. This classification includes locations where a nest was relocated under a valid permit.

This report adopts the primary nest ID assigned by Audubon's EagleWatch program (HD002, MN031, etc.) with suffixes of a, b, c, etc. indicating alternate nest locations (e.g., PO168a, HL065b, etc.). Newly identified

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nests are assigned temporary nest IDs (e.g., PONew01) until an EagleWatch ID is assigned, unless the new nest is clearly an alternate nest of a known eagle pair. For the purposes of this report, once Audubon assigns a nest ID, that ID remains static and tied to the specific geographical location. This is in contrast to the dynamic ID system Audubon uses from season to season where suffixes may change from year to year to indicate which nest location is the primary (active) location.

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4 RESULTS

Kleinfelder ecologists conducted a bald eagle nest activity status survey by helicopter on February 11, 2025, along a designated route (**Figure 2**). The weather conditions during the survey were mostly sunny to partly cloudy skies with wind directions varying from southwest to east-northeast and wind speeds of 5 mph. Temperatures during the survey ranged from 70°F to 79°F.

A total of 99 bald eagle nest locations were surveyed and included 36 active nests, 16 inactive nests (including those occupied by osprey), 44 unobserved nest locations, and three nests occupied by great horned owls (**Figure 3 and Table 1**). Of the 99 bald eagle nest locations, six new (active or inactive) nest locations were identified and/or surveyed during the 2025 survey (**Table 2**). Of the 36 active nests observed, 27 were located in pine trees (the large majority of which were live longleaf pine [*Pinus palustris*]), six were located on artificial structures (such as cell towers and electrical transmission towers), two were located on artificial nesting platforms attached to artificial structures (such as transmission towers), and one was located in a dead swamp tupelo (*Nyssa biflora*).

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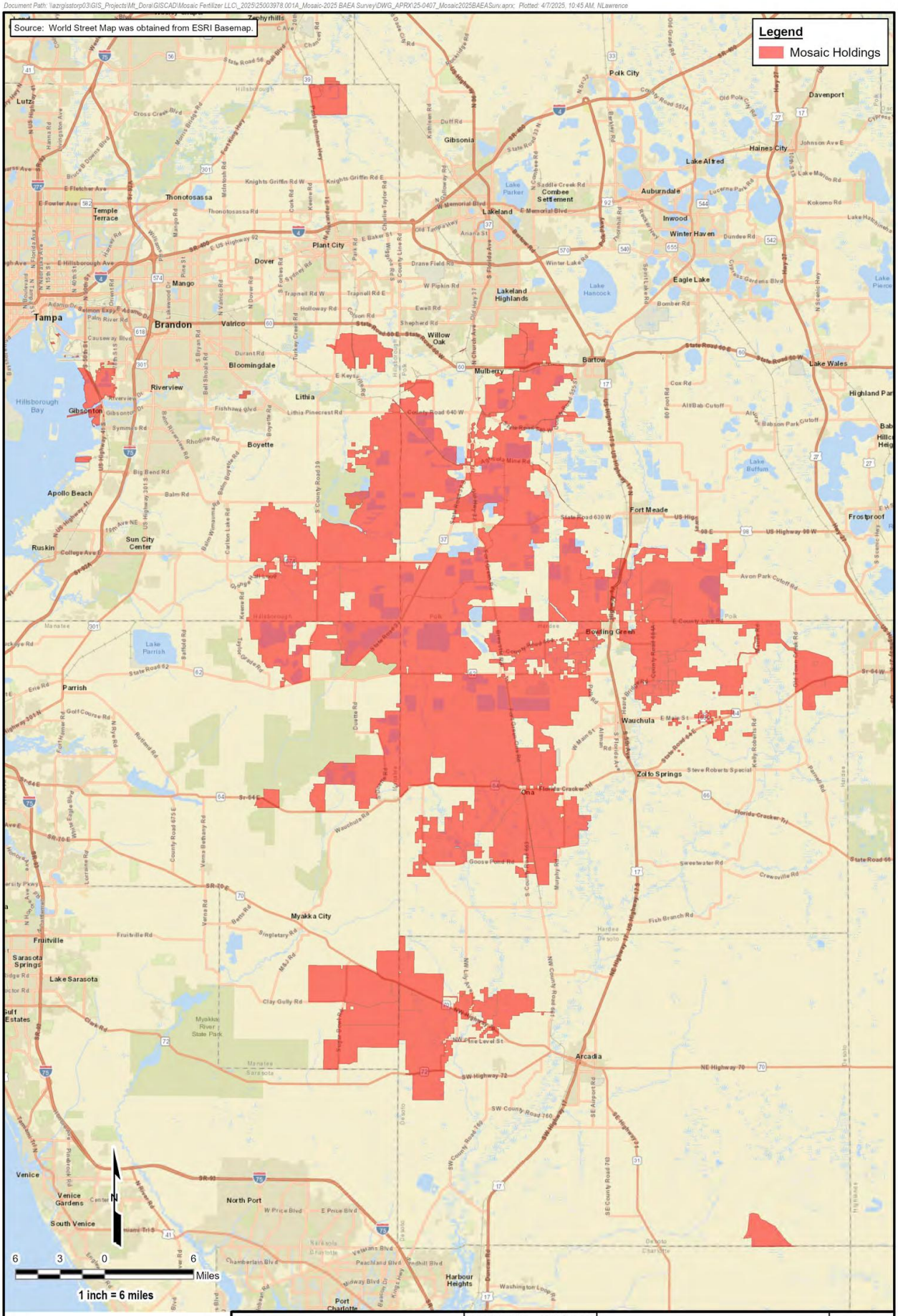
National Audubon Society. 2024. Eagle Watch Public View Nest Location Map v2. Accessed February 10, 2025. Eagle Watch Public View Nest Location Map v2.

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FIGURES

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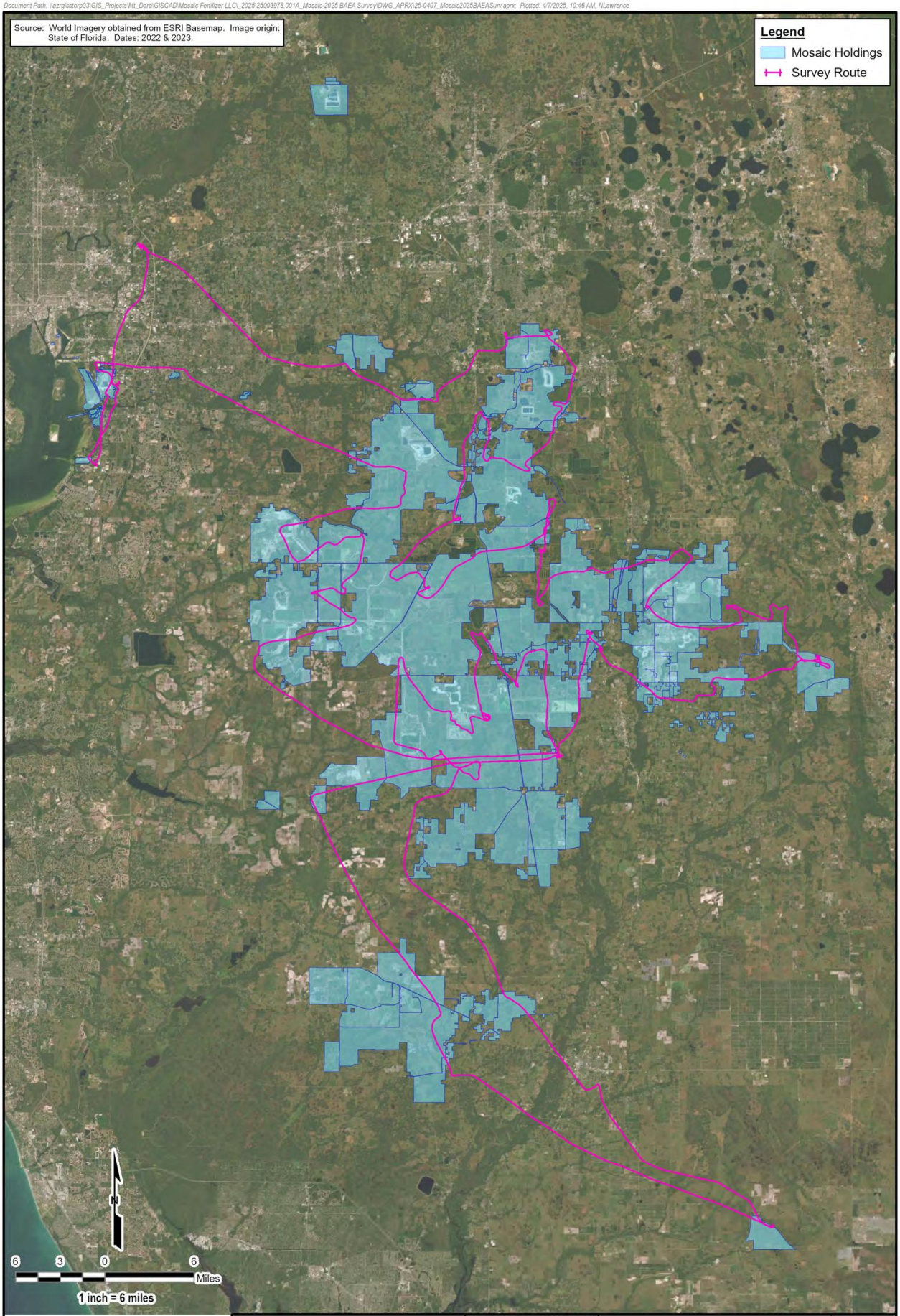
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Location Map

Mosaic Fertilizer, LLC
2025 Bald Eagle Nest Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco and Polk Counties

FIGURE
1



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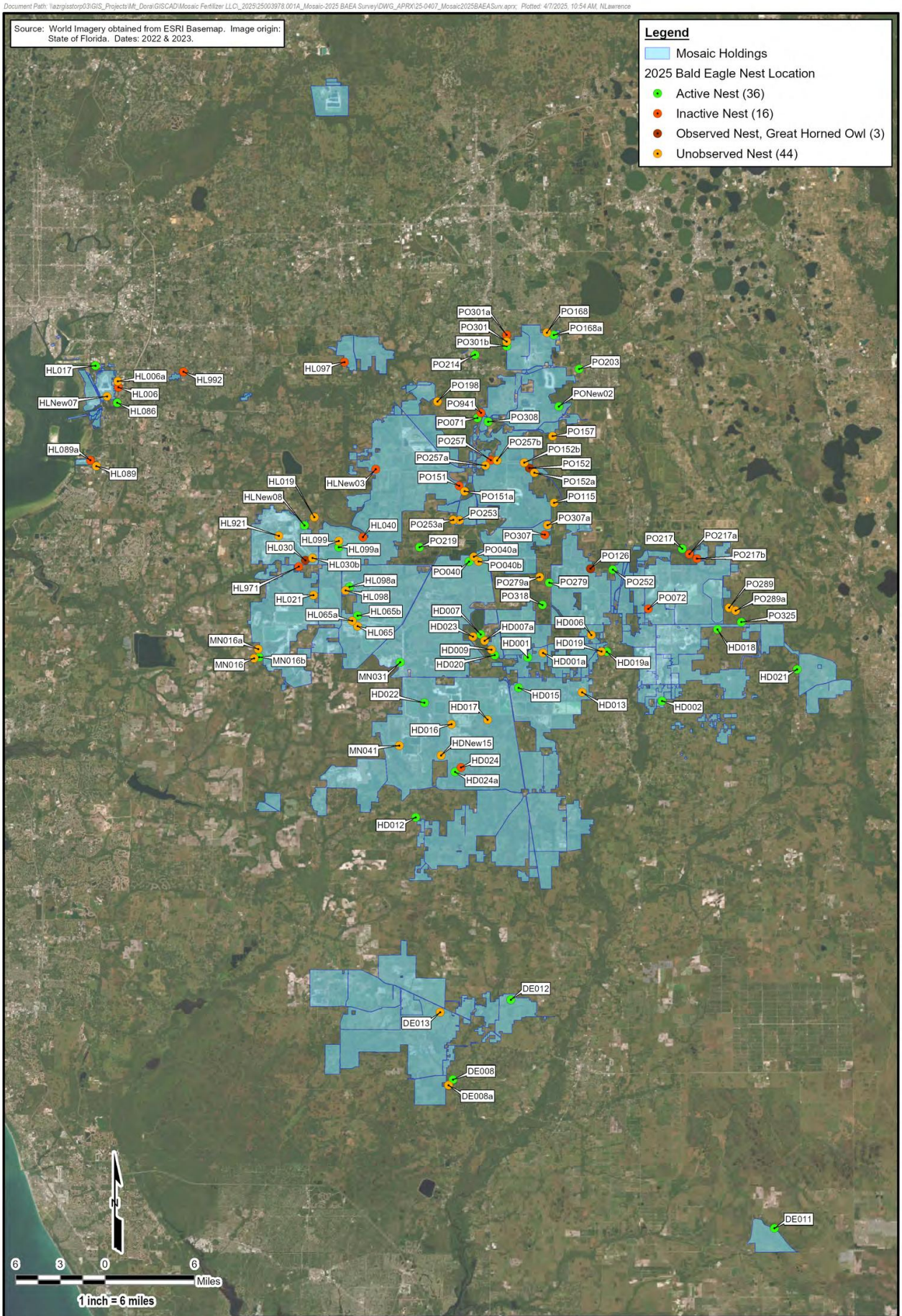
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Survey Route Map

Mosaic Fertilizer, LLC
2025 Bald Eagle Nest Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco and Polk Counties

FIGURE
2



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2025 Bald Eagle Nest Location Map

Mosaic Fertilizer, LLC
2025 Bald Eagle Nest Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco and Polk Counties

FIGURE
3

TABLES

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
DE008	Active	Nest was observed for the first time during the 2021 survey. Nest was located off-site in a dead longleaf pine (*Pinus palustris*) at the edge of a forested wetland south of State Road 72. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately five weeks old) and one adult.
DE008a	Unobserved	Nest was previously located off-site in a pine tree on the edge of a pasture and herbaceous wetland south of State Road 72 approximately 500 feet south of DE008 (active). At the time of the 2025 survey, the nest was unobserved.
DE011	Active	Nest location was observed for the first time during the 2024 survey. Nest was located off-site in a longleaf pine in the Peace River drainage basin in southeast DeSoto County. At the time of the 2025 survey, the nest was active with one adult in incubating position.
DE012	Active	Nest was observed for the first time in 2007. Nest was located in a longleaf pine at the edge of a forested wetland east of 91st Avenue. At the time of the 2025 survey, the nest was active with two primary down eaglets (approximately two weeks old) and one adult.
DE013	Unobserved	Nest was observed for the first time in 2017. Nest was previously located in a cypress tree (*Taxodium distichum*) in a forested wetland south of State Road 70. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HD001	Active	Nest was observed for the first time during the 2022 survey. Nest was located in a longleaf pine bordering a pasture south of County Road 664. At the time of the 2025 survey, the nest was active with two primary down eaglets (approximately one week old) and one adult.
HD001a	Unobserved	Nest was previously located in a pine tree on the southern edge of a citrus grove approximately 1.0 mile south-southwest of HD001 (active). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HD002	Active	Nest was located off-site in a longleaf pine in a pasture. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately five weeks old) and one adult.
HD006	Unobserved	Nest was previously located in a snag in the Little Payne Creek floodplain. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
HD007	Active	Nest was located off-site in a longleaf pine in the Payne Creek floodplain east of Hardee Lakes Park. At the time of the 2025 survey, the nest was active with one primary down eaglet (approximately one week old) and one adult perched in adjacent tree.
HD007a	Unobserved	Nest was observed for the first time during the 2017 survey. Nest was previously located off-site in a dead pine tree in the Payne Creek floodplain east of Hardee Lakes Park approximately 0.5 miles southeast of HD007 (active). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HD009	Unobserved	Nest was observed for the first time during the 2013-2014 season. Nest was previously located in a snag in mixed wetland hardwoods associated with the Payne Creek floodplain near Hardee Lakes Park. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HD012	Active	Nest was located off-site in a longleaf pine in a pasture west of Horse Creek. At the time of the 2025 survey, the nest was active with one adult in incubating position.
HD013	Unobserved	Nest was observed for the first time during the 2014-2015 season. Nest was previously located along a ditch and berm associated with a mine cut west of Polk Road. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HD015	Active	Nest was observed for the first time during the 2017 survey. Nest was located in a longleaf pine bordering a pasture east of County Road 663. At the time of the 2025 survey, the nest was active with two secondary down eaglets (approximately four weeks old).
HD016	Unobserved	Nest was observed for the first time during the 2018 survey. Nest was previously located in a pine tree associated with the Brushy Creek floodplain. At the time of the 2025 survey, the nest was unobserved. The nest and nest tree were lost during Hurricane Ian in September 2022. No bald eagles were observed in the vicinity at the time of the survey.
HD017	Unobserved	Nest was observed for the first time during the 2018 survey. Nest was located in a longleaf pine in mesic flatwoods associated with the Lettis Creek floodplain on the edge of improved pasture. At the time of the 2025 survey, the nest was unobserved. One immature bald eagle was observed in the vicinity.
HD018	Active	Nest was observed for the first time during the 2020 survey. Nest was located off-site in a longleaf pine in mixed wetland hardwoods south of County Line Road. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately six weeks old).

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
HD019	Unobserved	Nest was observed for the first time during the 2021 survey. Nest was located off-site in a longleaf pine in mixed wetland hardwoods associated with the Payne Creek floodplain. At the time of the 2025 survey, the nest was unobserved.
HD019a	Active	Nest was observed for the first time during the 2025 survey. Nest was located off-site in a longleaf pine in mixed wetland hardwoods associated with the Payne Creek floodplain approximately 340 feet east of HD019 (unobserved). At the time of the 2025 survey, the nest was active with two secondary down stage eaglets (approximately three weeks old) and one adult.
HD020	Active	Previously identified as HDNew08, nest was observed for the first time during the 2015-2016 season. Nest was located off-site in a pine tree in mixed wetland hardwoods associated with the Payne Creek floodplain near Hardee Lakes Park. At the time of the 2025 survey, the nest was active with one adult in incubating position.
HD021	Active	Previously identified as HDNew18, nest was observed for the first time during the 2023 survey. The nest was located off-site in a longleaf pine in improved pastures west of Old Town Creek Road. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately five weeks old).
HD022	Active	Previously identified as HDNew19, nest was observed for the first time during the 2023 survey. The nest was located in a longleaf pine tree in mesic flatwoods in the Horse Creek floodplain. At the time of the 2025 survey, the nest was active with one primary down stage eaglet (approximately two weeks old) and one adult.
HD023	Unobserved	Location observed for the first time during 2025 survey. According to Audubon EagleWatch data, the nest was previously located off-site in a dead tree within Hardee Lakes Park. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HD024	Inactive	Previously identified as HDNew17, nest was observed for the first time by Mosaic staff and contractors in 2022. Nest was located in a dead longleaf pine in mixed wetland hardwoods east of Sidney Roberts Road. At the time of the 2025 survey, the nest was inactive and in poor repair.
HD024a	Active	Nest observed for the first time by Kleinfelder ecologists in 2024. The nest was located on-site in a longleaf pine in mixed wetland hardwoods east of Sidney Roberts Road approximately 0.25 miles southeast of HD024 (inactive). At the time of the 2025 survey, the nest was active with one adult.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
HDNew15	Unobserved	Nest was observed for the first time by Mosaic staff and contractors in 2021 (does not have an Audubon EagleWatch Nest ID). Nest was previously located in a pine tree in mixed wetland hardwoods east of Horse Creek. Nest was lost during Hurricane Ian in September 2022. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HL006	Inactive	Nest was observed for the first time during the 2018 survey. Nest was located off-site in a longleaf pine in a forested area east of South 78th Street in Riverview. At the time of the 2025 survey, the nest was inactive but in good repair. No bald eagles were observed in the vicinity.
HL006a	Unobserved	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located off-site in a metal power line pylon east of South 78th Street in Riverview approximately 1,200 feet north of HL006 (inactive). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HL017	Active	Nest was located off-site in a longleaf pine in an undeveloped parcel near Tampa Bay South of Madison Avenue. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately five weeks old) and one adult.
HL019	Unobserved	Nest was previously located off-site in a pine tree in a pasture west of County Road 39 and east of Hurrah Creek. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HL021	Unobserved	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located in a pine tree on the edge of an improved pasture west of County Road 39. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HL030	GHOW	Nest was observed for the first time during the 2019 survey. HLNew05 was permitted to authorize relocation to this location in July 2018. Nest was located on a nesting platform attached to a concrete pole. At the time of the 2025 survey, the nest was occupied by great horned owls (*Bubo virginianus*).
HL030b	Unobserved	Nest was previously located in a pine tree in a pasture approximately 0.5 miles east-northeast of HL030 (GHOW). Between 2016 and 2017, the nest and nest tree were lost due to natural causes. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
HL040	Inactive	Nest was located in a longleaf pine in mixed wetland hardwoods associated with the Alafia River-South Prong floodplain. At the time of the 2025 survey, the nest was inactive and the nest trees appeared dead with broken limbs and no live needles (presumably as a result of the 2024 hurricane season). No bald eagles were observed in the vicinity.
HL065	Unobserved	Nest was observed for the first time in 2011. The nest was previously located in a pine tree in mixed wetland hardwoods associated with the Alderman Creek floodplain approximately 500 feet south-southwest of HL065b (active). At the time of the 2025 survey, the nest was unobserved.
HL065a	Unobserved	Nest was observed for the first time during the 2019 survey. Nest was previously located in a longleaf pine in mixed wetland hardwoods associated with the Alderman Creek floodplain approximately 500 feet southwest of HL065b (active). At the time of the 2025 survey, the nest was unobserved.
HL065b	Active	Nest observed for the first time during the 2023 survey. Nest was located in a pine tree in mixed wetland hardwoods associated with the Alderman Creek floodplain. At the time of the 2025 survey, the nest was active with one egg and one adult.
HL086	Active	Nest observed for the first time during the 2023 survey. Nest was located off-site in an electrical transmission tower south of Riverview Drive and north of the Alafia River. At the time of the 2025 survey, the nest was active with one adult in incubating position.
HL089	Unobserved	Nest location observed for the first time during the 2023 survey. Nest was previously located off-site on a cell tower near the intersection of Pembroke Road and South Tamiami Trail, but has since been removed under permit. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HL089a	Inactive	Nest location observed for the first time during the 2024 survey. Nest was located on a cell tower near the intersection of Pembroke Road and South Tamiami Trail approximately 2,900 feet northwest of HL089 (unobserved). At the time of the 2025 survey, the nest was inactive and in poor repair. No feathers, food material, or whitewash were visible. No bald eagles were observed in the vicinity.
HL097	Inactive	Nest was observed for the first time during the 2013-2014 season. Nest was located in a dead longleaf pine in mixed hardwood-coniferous forest near old clay settling areas and artificial impoundments/reservoirs. At the time of the 2025 survey, the nest was inactive and small. No bald eagles were observed in the vicinity.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
HL098	Unobserved	Nest was observed for the first time during the 2017 survey. Nest was located in a pine tree in mixed wetland hardwoods north of Alderman Creek. At the time of the 2025 survey, the nest was unobserved.
HL098a	Active	Nest was observed for the first time during the 2017 survey. Nest was located in a pine tree in mixed wetland hardwoods north of Alderman Creek approximately 430 feet northeast of HL098 (unobserved). At the time of the 2025 survey, the nest was active with two eggs.
HL099	Unobserved	Nest was observed for the first time by Mosaic staff and consultants in January 2019. Nest was previously located in a pine tree in mixed wetland hardwoods associated with Hurrah Creek near clay settling areas east of County Road 39 approximately 200 feet north of HL099a (active). At the time of the 2025 survey, the nest was unobserved.
HL099a	Active	Nest was observed for the first time during the 2023 survey. Nest was located in a dead longleaf pine in mixed wetland hardwoods associated with Hurrah Creek near clay settling areas east of County Road 39. At the time of the 2025 survey, the nest was active with one adult in incubating position.
HL921	Unobserved	Nest was observed for the first time by Mosaic staff and consultants in October 2021. Nest was previously located on a maintenance platform on the boom of an inactive dragline excavator. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HL971	Inactive	Nest location was observed for the first time during the 2024 survey. Nest was located on a cell tower south of FL-674. At the time of the 2025 survey, the nest was occupied by osprey (*Pandion haliaetus*).
HL992	Inactive	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located off-site on a cell tower near the corner of West Bloomingdale Avenue and South Kings Avenue. At the time of the 2025 survey, the nest was occupied by osprey.
HLNew03	Inactive	Nest observed for the first time during the 2015 survey. Nest was located on a nesting platform attached to a transmission tower near a large reclaimed clay settling area. At the time of the 2025 survey, the nest was inactive and in poor repair. No feathers, food material, or whitewash were visible. No bald eagles were observed in the vicinity.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
HLNew07	Unobserved	Nest observed for the first time by Mosaic staff and consultants in December 2018. Nest was previously located off-site in a red maple tree (*Acer rubrum*) in mixed wetland hardwoods south of the relocated Archie Creek. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
HLNew08	Active	Nest was identified by Kleinfelder ecologists in February 2025 (does not have an Audubon EagleWatch Nest ID). The nest was located in a swamp tupelo (*Nyssa biflora*) along Hurrah Creek west of S County Road 39. At the time of the 2025 survey, the nest was active with two primary down eaglets (approximately two weeks old) and one adult.
MN016	Unobserved	Nest was previously located off-site in a pine tree in improved pasture north of Taylor Grade. At the time of the 2025 survey, the nest was unobserved.
MN016a	Unobserved	Nest was identified by Kleinfelder ecologists in 2024. The nest was located off-site in a longleaf pine in improved pasture north of Taylor Grade. At the time of the 2025 survey, the nest was unobserved and presumed lost during the 2024 hurricane season.
MN016b	Active	Nest was identified by Kleinfelder ecologists in February 2025 (does not have an Audubon EagleWatch Nest ID). The nest was located off-site in a longleaf pine in improved pasture north of Taylor Grade approximately 0.2 miles east-northeast of MN016 and approximately 0.5 miles south-southeast of MN016a. At the time of the 2025 survey, the nest appeared in good repair. No bald eagles were observed in the vicinity.
MN031	Active	Nest was located in a longleaf pine in mixed hardwood-coniferous forest between marshes associated with Horse Creek. At the time of the 2025 survey, the nest was active with two secondary down eaglets (approximately four weeks old) and one adult.
MN041	Unobserved	Nest observed for the first time in 2011. Nest was located in a longleaf pine in mixed wetland hardwoods in the easternmost lobe of the West Fork Horse Creek floodplain east of Duette Road. At the time of the 2025 survey, the nest was unobserved. One immature bald eagle was observed flying nearby.
PO040	Active	Nest was observed for the first time during the 2020 survey. Nest was located off-site in a longleaf pine in mixed wetland hardwoods south of the TECO Polk Power Station cooling ponds. At the time of the 2025 survey, the nest was active with one secondary down eaglet (approximately three weeks old) and one adult.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
PO040a	Unobserved	Nest was previously located off-site in a longleaf pine in mixed wetland hardwoods south of the TECO Polk Power Station cooling ponds and approximately 250 feet northeast of PO040 (active). At the time of the 2025 survey, the nest was unobserved.
PO040b	Unobserved	Nest was previously located off-site in a pine tree in mixed wetland hardwoods south of the TECO Polk Power Station cooling ponds and approximately 400 feet east of PO040 (active). At the time of the 2025 survey, the nest was unobserved.
PO071	Active	Nest was located in a pine tree near a pond between Old State Highway 37 and railroad tracks south of County Road 640. At the time of the 2025 survey, the nest was active with one transitional stage eaglet (approximately five weeks old) and one adult.
PO072	Inactive	This location included two nests; one on each level of a nesting platform in improved pasture east of Mount Pisgah Road. At the time of the 2025 survey, both levels were inactive and in poor repair. No bald eagles were observed in the vicinity.
PO115	Unobserved	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located off-site west of County Road 555 near Old Elim Cemetery. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO126	GHOW	Nest was located off-site on a nesting platform attached to a metal utility pole west of Peeples Road. At the time of the 2025 survey, the nest was occupied by great horned owls.
PO151	Inactive	Nest was observed for the first time during the 2022 survey. Nest was located on a large metal power pole along State Road 37. At the time of the 2025 survey, the nest was occupied by osprey.
PO151a	Unobserved	Nest was previously located off-site in a pine tree on the edge of a pasture east of State Road 37 approximately 600 feet southeast of PO151 (inactive). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO152	GHOW	Nest was observed for the first time during the 2021 survey. Nest was located in a longleaf pine in mixed wetland hardwoods south of Agricola Mine Road. At the time of the 2025 survey, the nest was occupied by great horned owls.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
PO152a	Unobserved	Nest was observed for the first time during the 2017 survey. Nest was previously located in a pine tree south of Agricola Mine Road approximately 750 feet southeast of PO152 (GHOW). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO152b	Unobserved	Nest was previously located in a pine tree approximately 1,200 feet northwest of PO152 (inactive). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO157	Unobserved	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located southwest of the intersection of Highway 640 and County Road 555. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO168	Unobserved	Nest was previously located in a pine tree in mixed hardwood-coniferous forest approximately 2,100 feet northwest of PO168a (active). Nest was presumed lost during Hurricane Ian in September 2022. At the time of the 2025 survey, the nest was unobserved.
PO168a	Active	Nest was located on a nesting platform attached to a utility structure on a north-south transmission line adjacent to improved pasture. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately six weeks old).
PO198	Unobserved	Nest was previously located off-site in a pine tree in unimproved/woodland pasture east of Anderson Road. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO203	Active	Nest was located off-site on a cell tower south of Highway 60 near Bartow. At the time of the 2025 survey, the nest was active with one adult in incubating position.
PO214	Active	Nest observed for the first time during the 2018 survey. Nest was located off-site on a cell tower west of State Road 37 north of Mulberry. At the time of the 2025 survey, the nest was active with one secondary down eaglet (approximately three weeks old) and one adult.
PO217	Active	Nest was observed for the first time during the 2019 survey. Nest was located off-site in an electrical transmission tower on the north side of Bowlegs Creek. At the time of the 2025 survey, the nest was active with two adults (one in incubating position).

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
PO217a	Inactive	Nest was observed for the first time during the 2017 survey. Nest was located off-site in an electrical transmission tower on the north side of Bowlegs Creek approximately 0.6 miles southeast of PO217 (active). At the time of the 2025 survey, the nest was occupied by osprey.
PO217b	Inactive	Nest was located off-site on a transmission tower on the north side of Bowlegs Creek approximately 1.2 miles southeast of PO217 (active). At the time of the 2025 survey, the nest was occupied by osprey.
PO219	Active	Nest was located off-site on a cell tower surrounded by former citrus groves north of State Road 674 and State Road 37. At the time of the 2025 survey, the nest was active with two secondary down eaglets (approximately three weeks old) and one adult.
PO252	Active	Nest was previously located off-site on a cell tower surrounded by agricultural fields west of Highway 17 and south-southwest of Fort Meade. At the time of the 2025 survey, the nest was active with two secondary down eaglets (approximately five weeks old) and one adult.
PO253	Unobserved	Nest was observed for the first time during the 2017 survey. Nest was previously located in a pine tree approximately 0.25 miles east of State Road 37. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO253a	Unobserved	Nest was observed for the first time during the 2013-2014 season. Nest was previously located off-site on a cell tower located at State Road 37 and County Road 630. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO257	Inactive	Nest was observed for the first time during the 2023 survey. Nest was located on a nesting platform attached to a utility pole on Agricola Mine Road. At the time of the 2025 survey, the nest was occupied by osprey.
PO257a	Unobserved	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located north of Agricola Mine Road approximately 500 feet southwest of PO257 (inactive). At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO257b	Unobserved	Nest was observed for the first time during the 2015 survey. Nest was previously located in a wooden transmission tower on Agricola Mine Road. Since the 2021 survey, the majority of wooden utility poles had been replaced with metal utility poles. At the time of the 2025 survey, the nest was unobserved and the nesting platforms installed on the metal utility poles were occupied by osprey.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
PO279	Active	Nest was observed for the first time during the 2021 survey. Nest was located in a longleaf pine in improved pasture west of District Line Road. At the time of the 2025 survey, the nest was active with one secondary down eaglet (approximately four weeks old) and one adult perched in adjacent tree.
PO279a	Unobserved	Nest was observed for the first time during the 2015 survey. Nest was located in a dead tree on the edge of an old mine cut approximately 0.7 miles northwest of PO279 (active). At the time of the 2025 survey, the nest was unobserved.
PO289	Unobserved	Nest location first observed during 2024 survey. According to Audubon EagleWatch data, the nest was previously located off-site in a live tree west of Singletary Road. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO289a	Unobserved	Nest location first observed during 2024 survey. According to Audubon EagleWatch data, the nest was previously located off-site on an artificial structure west of Singletary Road. At the time of the 2025 survey, the nest was unobserved. No bald eagles were observed in the vicinity.
PO301	Unobserved	Nest location was observed for the first time during the 2023 survey. According to Audubon EagleWatch data, the nest was previously located off-site on a power pole within Se7en Wetlands approximately 1,300 feet south of PO301a (inactive). At the time of the 2025 survey, the nest was unobserved.
PO301a	Inactive	Nest was observed for the first time during the 2023 survey. Nest was located off-site on a nesting platform attached to a power pole within Se7en Wetlands. At the time of the 2025 survey, the nest was occupied by osprey.
PO301b	Active	Nest was observed for the first time during the 2024 survey. Nest was located off-site on a nesting platform attached to a power pole within Se7en Wetlands approximately 660 feet south of PO301 (unobserved) and 2,000 feet south of PO301a (inactive). At the time of the 2025 survey, the nest was active with one juvenile stage eaglet (approximately six weeks old) and one adult.
PO307	Inactive	Nest was observed for the first time during the 2017 survey. Nest was located off-site on a cell tower at the end of Old Brewster Road. At the time of the 2025 survey, the nest was inactive and in poor repair. No bald eagles were observed in the vicinity.

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TABLE 1. 2024-2025 BALD EAGLE NEST ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	Activity Status	Observations
PO307a	Unobserved	Nest was observed for the first time in 2011. The nest was previously located in a pine tree in a wooded area south of County Road 630 approximately 3,500 feet north of PO307 (inactive). At the time of the 2025 survey, the nest was unobserved.
PO308	Active	Nest was observed for the first time during the 2018 survey. Nest was located off-site in a longleaf pine in mixed wetland hardwoods associated with the Alafia River - North Prong south of County Road 640 and approximately 0.75 miles east-southeast of PO071 (active). At the time of the 2025 survey, the nest was active with one adult in incubating position.
PO318	Active	Nest location was observed for the first time during the 2024 survey. Nest was located off-site in a longleaf pine west of District Line Road near Little Payne Creek. At the time of the 2025 survey, the nest was active with one juvenile stage eaglet (approximately seven weeks old) and one adult.
PO325	Active	Previously identified as PONew01, nest was identified by Kleinfelder ecologists in May 2023 and observed for the first time during the 2024 survey. The nest was located off-site in a longleaf pine in flatwoods north of County Line Rd. At the time of the 2025 survey, the nest was active with two transitional stage eaglets (approximately five weeks old) and one adult.
PO941	Inactive	Nest was observed for the first time during the 2024 survey. The nest was located off-site on a cell tower north of County Road 640. At the time of the 2025 survey, the nest was inactive but appeared in fair repair. No bald eagles were observed in the vicinity.
PONew02	Active	Nest was identified by Kleinfelder ecologists in February 2025 (does not have an Audubon EagleWatch Nest ID). The nest was located in a longleaf pine in formerly mined land west of Agricola Rd. At the time of the 2025 survey, the nest was active with two secondary down eaglets (approximately two weeks old) and one adult.

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TABLE 2. 10-YEAR BALD EAGLE NEST ACTIVITY HISTORY
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	2015-2016[1]	2016-2017[1]	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
DE008	-	-	-	-	-	Active	Active	Active	Active	Active
DE008a	Active	Active	Active	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
DE011	-	-	-	-	-	-	-	-	Active	Active
DE012	Active	Active	Active	Inactive	Inactive	Inactive	Active	Active	Active	Active
DE013	-	Active	Inactive	Inactive	Inactive	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HD001	-	-	-	-	-	-	Active	Active	Active	Active
HD001a	Active	Inactive	GHOW	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HD002	Active	Active	Active	Active	Active	Inactive	Inactive	Inactive	Inactive	Active
HD006	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HD007	Inactive	Inactive	Inactive	Inactive	Inactive	Unobserved	Active	Inactive	Inactive	Active
HD007a	-	Active	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HD009	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HD012	Not Surveyed	Not Surveyed	Active	Active	Inactive	Active	Active	Active	Active	Active
HD013	Inactive	GHOW	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HD015	-	Active	Active	Active	Active	Active	Active	Inactive	Active	Active
HD016	-	-	Active	Active	Active	Active	Active	Unobserved	Unobserved	Unobserved
HD017	-	-	Active	Inactive	Active	Inactive	Inactive	Unobserved	Active	Unobserved
HD018	-	-	-	-	Active	Active	Active	Active	Active	Active
HD019	-	-	-	-	-	Active	Active	Active	Active	Unobserved
HD019a*	-	-	-	-	-	-	-	-	-	Active
HD020	Active	Active	Active	Inactive	Active	Active	Active	Active	Active	Active
HD021	-	-	-	-	-	-	-	Active	Active	Active
HD022	-	-	-	-	-	-	-	Active	Active	Active
HD023	-	-	-	-	-	-	-	-	Active[2]	Unobserved
HD024	-	-	-	-	-	-	-	Active	Active	Inactive
HD024a*	-	-	-	-	-	-	-	-	-	Active
HDNew15	-	-	-	-	-	Inactive	GHOW	Unobserved	Unobserved	Unobserved
HL006	-	-	Active	Inactive	Inactive	Active	Inactive	Inactive	Active	Inactive
HL006a	-	-	-	-	-	-	-	Unobserved	Unobserved	Unobserved

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TABLE 2. 10-YEAR BALD EAGLE NEST ACTIVITY HISTORY
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	2015-2016[1]	2016-2017[1]	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
HL017	Inactive	Inactive	Active	Active	Active	Active	Inactive	Active	Active	Active
HL019	Active	Active	Active	Inactive	Inactive	Inactive	Unobserved	Unobserved	Unobserved	Unobserved
HL021	Not Surveyed	Not Surveyed	Not Surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Unobserved	Unobserved	Unobserved
HL030	-	-	-	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	GHOW
HL030b	Inactive	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HL040	Active	Inactive	Inactive	Active	Active	Inactive	Active	Inactive	Active	Inactive
HL065	Active	Active	Active	Inactive	Active	Active	Active	Unobserved	Unobserved	Unobserved
HL065a	-	-	-	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
HL065b	-	-	-	-	-	-	-	Active	Active	Active
HL086	-	-	-	-	-	-	Active[2]	Active	Active	Active
HL089	-	-	-	-	-	-	Active[2]	Active	Unobserved	Unobserved
HL089a	-	-	-	-	-	-	-	-	Inactive	Inactive
HL097	Active	Active	Active	Active	Active	Active	Inactive	Active	Active	Inactive
HL098	-	Active	Active	Active	Active	Active	Active	Inactive	Active	Unobserved
HL098a*										Active
HL099	-	-	-	Inactive	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved
HL099a	-	-	-	-	-	-	-	Active	Active	Active
HL921	-	-	-	-	-	-	Inactive	Unobserved	Unobserved	Unobserved
HL971	-	-	-	-	-	-	-	-	Inactive	Inactive
HL992	-	-	-	-	-	-	-	Unobserved	Unobserved	Inactive
HLNew03	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
HLNew07	-	-	-	Inactive	GHOW	GHOW	GHOW	Unobserved	Unobserved	Unobserved
HLNew08*	-	-	-	-	-	-	-	-	-	Active
MN016	Inactive	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
MN016a	-	-	-	-	-	-	-	-	Active	Unobserved
MN016b*	-	-	-	-	-	-	-	-	-	Active
MN031	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active
MN041	Active	Inactive	Active	Inactive	Inactive	Active	Active	Active	GHOW	Unobserved
PO040	-	-	-	-	Active	Active	Active	Active	Active	Active

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TABLE 2. 10-YEAR BALD EAGLE NEST ACTIVITY HISTORY
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	2015-2016[1]	2016-2017[1]	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
PO040a	-	-	-	-	-	-	-	Unobserved	Unobserved	Unobserved
PO040b	-	-	Active	Inactive	Inactive	Inactive	Inactive	Inactive	Unobserved	Unobserved
PO071	Active	Active	Unobserved	Active	Active	Active	Active	Active	Active	Active
PO072	Active	Active	Active	GHOW	Inactive	GHOW	GHOW	GHOW	GHOW	Inactive
PO115	-	-	-	-	-	-	-	Unobserved	Unobserved	Unobserved
PO126	Inactive	Not Surveyed	Not Surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Inactive	Inactive	GHOW
PO151	-	-	-	-	-	-	Active	Inactive	Inactive	Inactive
PO151a	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
PO152	-	-	-	-	-	Active	Active	Active	Inactive	GHOW
PO152a	-	Active	Active	Active	Active	GHOW	Inactive	Unobserved	Unobserved	Unobserved
PO152b	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
PO157	-	-	-	-	-	-	-	Unobserved	Unobserved	Unobserved
PO168	-	-	Active	Active	Inactive	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
PO168a	Active	Active	Inactive	Inactive	Inactive	Inactive	Active	Active	Active	Active
PO198	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
PO203	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active
PO214	Not Surveyed	Not Surveyed	Active	Active	Active	Active	Active	Active	Active	Active
PO217	-	-	-	Active	Active	Active	Inactive	Active	Active	Active
PO217a	-	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Inactive	Inactive	Inactive
PO217b	Active	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
PO219	Active	Inactive	Active	Active	Active	Active	Active	Inactive	Active	Active
PO252	Active	Not Surveyed	Active	Active	Active	Unobserved	Unobserved	Unobserved	Active	Active
PO253	-	Active	Active	GHOW	GHOW	Inactive	Unobserved	Unobserved	Unobserved	Unobserved
PO253a	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved
PO257	-	-	-	-	-	-	-	Inactive	Inactive	Inactive
PO257a	-	-	-	-	-	-	-	Unobserved	Inactive	Unobserved
PO257b	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Unobserved	Unobserved	Unobserved	Unobserved
PO279	-	-	-	-	-	Active	Active	Inactive	Active	Active
PO279a	Active	Active	Unobserved	Unobserved	Unobserved	Unobserved	Unobserved	Inactive	Inactive	Unobserved

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TABLE 2. 10-YEAR BALD EAGLE NEST ACTIVITY HISTORY
MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025

Nest ID	2015-2016[1]	2016-2017[1]	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
PO289	-	-	-	-	-	-	-	-	Unobserved	Unobserved
PO289a	-	-	-	-	-	-	-	-	Unobserved	Unobserved
PO301	-	-	-	-	-	-	-	Unobserved	Unobserved	Unobserved
PO301a	-	-	-	-	-	-	-	Active	Inactive	Inactive
PO301b	-	-	-	-	-	-	-	-	Active	Active
PO307	-	-	Inactive	Inactive	Active	Active	Active	Active	Inactive	Inactive
PO307a	Inactive	Inactive	Inactive	Active	Inactive	Inactive	Unobserved	Unobserved	Unobserved	Unobserved
PO308	-	-	Active	Active	Inactive	Active	Active	Inactive	Active	Active
PO318	-	-	-	-	-	-	-	-	Active	Active
PO325	-	-	-	-	-	-	-	-	Active	Active
PO941	-	-	-	-	-	-	-	Inactive[2]	Inactive	Inactive
PONew02*	-	-	-	-	-	-	-	-	-	Active

[1]Data obtained from Cardno Bald Eagle Nest Activity Status Reports (2014-2015, 2015-2016, and 2016-2017 Nesting Seasons) and FWC Eagle Nesting GIS shapefile.

[2]Activity data obtained from Audubon EagleWatch.

*Nest first observed during 2025 survey.

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APPENDICES

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APPENDIX A – PHOTOGRAPHIC DOCUMENTATION

MOSAIC FERTILIZER, LLC
2025 BALD EAGLE NEST ACTIVITY STATUS SURVEY
FEBRUARY 2025



DE008



DE011



DE012



HD001



HD002



HD007



HD012



HD015



HD018



HD019a



HD020



HD021



HD022



HD024



HD024a



HL006



HL017



HL030



HL040



HL065b



HL086



HL089a



HL097



HL098a



HL099a



HL971



HL992



HLNew03



HLNew08



MN016b



MN031



PO040



PO071



PO072



PO126



PO151



PO152



PO168a



PO203



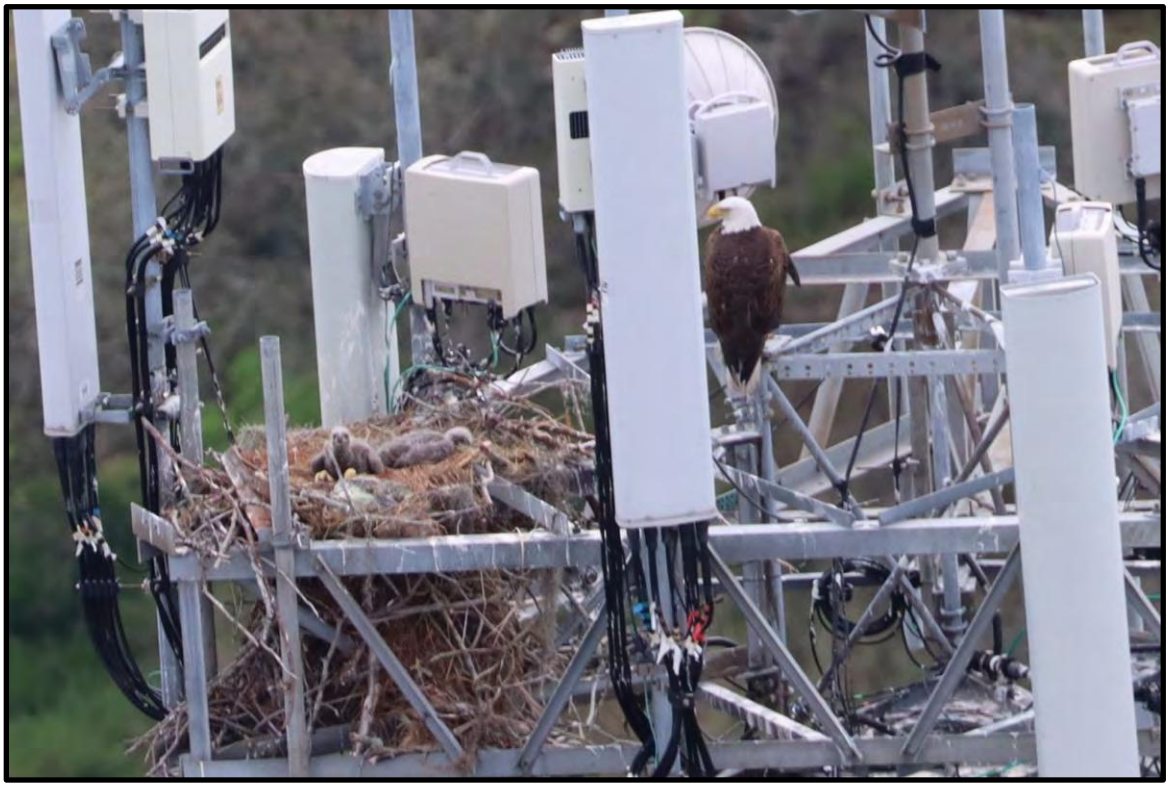
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PO217



PO217a



PO219



PO252



PO257



PO279



PO301b



PO307



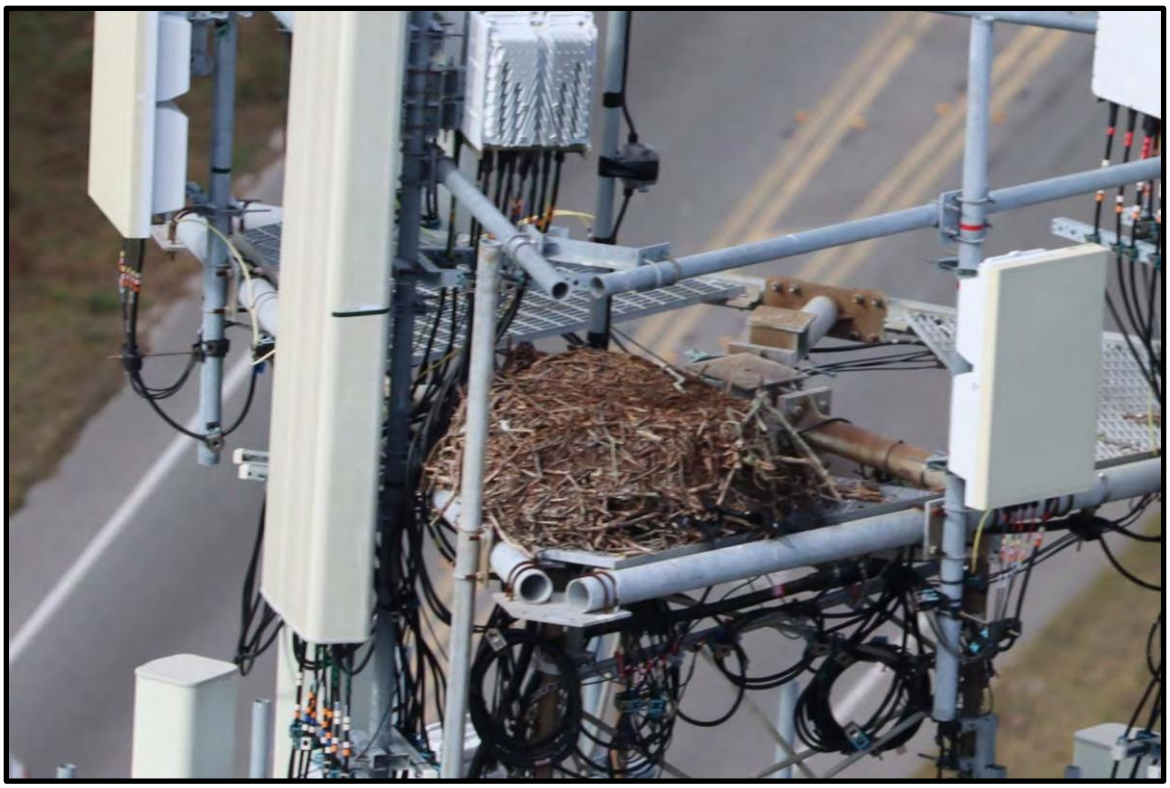
PO308



PO318



PO325



PO941



PONew02

MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
DESOTO, HARDEE, HILLSBOROUGH, MANATEE, PASCO, AND POLK COUNTIES, FLORIDA
KLEINFELDER PROJECT #25000377.001A

APRIL 2024

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A Report Prepared for:

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MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
DESOTO, HARDEE, HILLSBOROUGH, MANATEE, PASCO, AND POLK COUNTIES, FLORIDA

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A Photographic Documentation

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MOSAIC FERTILIZER, LLC

2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY

DESOTO, HARDEE, HILLSBOROUGH, MANATEE, PASCO, AND POLK COUNTIES, FLORIDA

1 EXECUTIVE SUMMARY

Kleinfelder conducted an aerial wading bird colony activity status survey on April 25, 2024, within portions of the approximately 368,355-acre Mosaic Fertilizer, LLC holdings in DeSoto, Hardee, Hillsborough, Manatee, Pasco, and Polk Counties. A total of 70 historic and extant wading bird colony locations were surveyed including 33 active colony locations, three inactive colony locations, and 34 unobserved colony locations. A detailed discussion of the methodologies used, and results is presented herein.

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2 INTRODUCTION

In support of Mosaic Fertilizer, LLC's (Mosaic) Avian Protection Plan, Kleinfelder ecologists conducted an aerial wading bird colony activity status survey within the approximately 368,355-acre Mosaic Fertilizer, LLC land holdings in DeSoto, Hardee, Hillsborough, Manatee, Pasco, and Polk Counties (**Figure 1**). Kleinfelder ecologists followed a route designed to survey historic and extant wading bird colony locations identified by agencies (Florida Fish and Wildlife Conservation Commission [FWC]) and/or Mosaic consultants (Kleinfelder, Flatwoods Consulting Group, Cardno ENTRIX, etc.), and located within approximately 0.5 miles of Mosaic holdings (**Figure 2**). This report represents the results of the survey conducted on April 25, 2024.

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3 METHODOLOGY

3.1 REGULATORY AND DATABASE REVIEW

A review of available literature and FWC databases for documented occurrences of wading bird colonies located on or within 0.5 miles of Mosaic holdings was conducted on April 14, 2024, and included the following sources:

- FWC Historic Waterbird Colony Locator (FWC FWRI n.d.),
- Mosaic Wading Bird Colony Status Report 2011 and 2012 Nesting Seasons (Cardno 2012),
- Wading Bird Colony Activity Status Survey (Kleinfelder 2023), and
- FWC Imperiled Wading Bird Colony Viewer (FWC FWRI 2022).

3.2 WADING BIRD COLONY ACTIVITY STATUS SURVEY FIELD PROTOCOL

Taken as a group, wading birds may nest at any time of the year in Florida, however, nesting primarily occurs between February and August in central Florida. The FWC Species Conservation Measures and Permitting Guidelines, Little Blue Heron, Reddish Egret, Roseate Spoonbill, Tricolored Heron *Egretta caerulea*, *Egretta rufescens*, *Platalea ajaja*, *Egretta tricolor* (FWC 2018) recommend specific survey windows for State-Threatened wading birds. In the Central Zone, which includes Mosaic holdings, the recommended survey window for tricolored and little blue herons is April 15 through June 31, and the recommended survey window for roseate spoonbills is February 15 through April 31.

Historic, extant, or suspected wading bird colony locations on or within 0.5 miles of Mosaic holdings were surveyed by helicopter. This survey design was not intended to constitute 100% coverage of all Mosaic holdings. Measures to avoid take relevant to manned helicopter surveys were implemented pursuant to the FWC guidelines (FWC 2018). These measures included:

- Maintaining a 330-foot (100 m) buffer around active nests for pedestrian traffic; operation of a personal watercraft, boat, or other vehicle,

- Maintaining a 200-foot (61 m) buffer (in vertical height as well as horizontal distance) from an active nest when operating an unmanned or remotely controlled UAS [Unmanned Aircraft System] or boat, and

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- Operating either manned or unmanned aircraft in a manner that does not result in flushing of birds from active nests or active breeding colonies.

Kleinfelder ecologists observed and photographed each active location using a high-resolution camera equipped with significant optical and digital zoom (Canon image stabilized EF 100-400mm f/4.5-5.6L IS USM lens).

3.2.1 ACTIVITY STATUS

Each colony location was assigned an activity status based on the following scheme:

Active – A colony location that showed evidence of current colonial wading bird nesting, including nests with eggs and/or young, and/or recently hatched juveniles (presumably incapable of sustained flight) still at the nest site.

Inactive – A colony location previously documented as Active in the past but not showing evidence of current nesting activity. May be used if evidence of past nesting, such as used stick nests, was observed, and/or to indicate a recent breeding site (used at least once in the preceding five years).

Unknown – A location without any known previous activity status data. Status used by FWC only. Presumably used in cases where the location was not surveyed and/or the colony location was discovered in subsequent seasons.

Unobserved – A colony location that was previously surveyed, but which is no longer present. Suitable habitat may or may not be present. This status includes locations where take was conducted under a valid incidental take permit.

Not Surveyed – Colony location was not surveyed during that year's effort, either because the location was unknown as a nesting location, or the location was not included in the year's survey effort for various reasons (distance from Mosaic holdings, ongoing monitoring conducted by other entities, etc.).

Single, isolated nests of wading birds were not considered colonies and therefore not included in this report unless they were of a listed wading bird species.

3.2.2 COLONY SIZE

After reviewing digital photographs collected during the survey, colonies were categorized by total number of nests observed: <50, 50-250, 250-500, 500-1,000, 1,000-3,000, and >3,000 nests. Single, isolated nests of wading birds were not considered colonies and not included in this report unless the nest

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was of a listed wading bird species. A confidence level of low, medium, or high was assigned to each colony size estimate based on various factors such as visibility within the vegetative structure of the colony, quality of digital photographs, and unique, local seasonal progression of the colony.

3.2.3 SPECIES COMPOSITION

All colonial wading birds (including some considered waterbirds) known to breed in inland Florida observed at a colony location were recorded regardless of whether breeding was confirmed. As American white pelicans (*Pelecanus erythrorhynchos*) are not known to breed in Florida and reddish egrets (*Egretta rufescens*) are not known to breed in inland freshwater environments in Florida, they were excluded from the targeted wading bird species.

Target Wading Bird Species

Common Name	Scientific Name	Banding Code	Colonial Nester	FWC Status[1]	FWS Status[2]
Wood stork	*Mycteria americana*	WOST	Yes	FT	T
Anhinga	*Anhinga anhinga*	ANHI	Yes	-	-
Double-crested cormorant	*Nannopterum auritum*	DCCO	Yes	-	-
White ibis	*Eudocimus albus*	WHIB	Yes	-	-
Glossy ibis	*Plegadis falcinellus*	GLIB	Yes	-	-
Roseate spoonbill	*Platalea ajaja*	ROSP	Yes	ST	-
Least bittern	*Botarus exilis*	LEBI	Yes/No	-	-
Yellow-crowned night-heron	*Nyctanassa violacea*	YCNH	Yes/No	-	-
Black-crowned night-heron	*Nycticorax nycticorax*	BCNH	Yes	-	-
Litlle blue heron	*Egretta caerulea*	LBHE	Yes	ST	-
Tricolored heron	*Egretta tricolor*	TRHE	Yes	ST	-
Snowy egret	*Egretta thula*	SNEG	Yes	-	-
Green heron	*Butorides virescens*	GRHE	Yes/No	-	-
Western cattle-egret	*Ardea ibis*	WECE	Yes	-	-
Great egret	*Ardea alba*	GREG	Yes	-	-
Great blue heron	*Ardea herodias*	GBHE	Yes/No	-	-
Brown pelican	*Pelecanus occidentalis*	BRPE	Yes	-	-

[1]FWC – Florida Fish and Wildlife Conservation Commission; Rules Relating to Endangered or Threatened Species (Ch. 68A-27 FAC; updated May 2023) [Ranking: FE – Federally-designated Endangered, FT – Federally-designated Threatened, FT(S/A) – Federally-designated Threatened because of similarity of appearance, FXN – Federal non-essential experimental population, ST – State-designated Threatened].
[2]FWS Endangered and Threatened Wildlife (50 eCFR 17.11; accessed 4/14/2024 [Ranking: E - Endangered, T – Threatened, T(S/A) – Threatened by Similarity of Appearance].

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A confidence level of low, medium, or high was assigned to each colony's species composition based on various factors such as visibility within the vegetative structure of the colony and quality of digital photographs.

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4 RESULTS

Kleinfelder ecologists conducted a wading bird colony activity status survey by helicopter on April 25, 2024, along a route designed to survey historic and extant wading bird colony locations identified by agencies (FWC) and/or Mosaic consultants (Kleinfelder, Flatwoods Consulting Group, Cardno ENTRIX, etc.), and located within approximately 0.5 miles of Mosaic holdings (**Figure 2**). The weather conditions during the April 25 survey event consisted of temperatures ranging from 72 to 84 degrees Fahrenheit, sunny and mostly sunny skies, wind direction varying from north to east-northeast, and wind speed of 0 mph. Kleinfelder ecologists observed and photographed each active location using a high-resolution camera equipped with significant optical and digital zoom (Canon image stabilized EF 100-400mm f/4.5-5.6L IS USM lens) (**Appendix A**).

4.1 ACTIVITY STATUS

A total of 70 historic and/or extant colony locations were surveyed in a single day and included 33 active colonies, 3 inactive colonies, and 34 unobserved historic colony locations (**Figure 3**; **Tables 1 and 2**). Of the 33 active colonies, nine previously unidentified colony locations were observed during the 2024 survey (**Tables 1 and 2**). Three colony locations were assigned inactive status during the 2024 survey. Additionally, no used stick nests from previous seasons were detected at any of the unoccupied (unobserved) colony locations. One unobserved colony location, SFME-LC(14) / New002, was no longer present, as take had been previously conducted in October of 2022 as conditioned by FWC Migratory Bird Nest Removal Permit No. LSNR-20-00216 (**Figure 3; Table 1; Appendix A**).

Of the 36 historic colony locations identified by the FWC during the 1970s, 1980s, and 1990s (identified by six-digit IDs, e.g., 611157), only five (one in Hillsborough County and four in Polk County) were found to be active during the 2024 survey (611158, 615034, 616039 / Mulberry Northeast, 616101, and PR1 / 616042). Of those five historic colony locations, two were unobserved during the 2023 survey (611158 and 615034) (**Figure 3; Tables 1 and 2**).

Four historic colony locations were not surveyed during the 2024 survey (**Figure 3 and Table 2**). Colony 615033 in Polk County, and 615128 in Manatee County were excluded based on their distance from Mosaic holdings (greater than 0.5 miles). Colonies 615007 and 615333 in Hillsborough County were excluded as they were part of the Richard T. Paul Alafia Bank Sanctuary which is leased by Audubon Florida

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and designated as a Critical Wildlife Area by the FWC. The sanctuary is leased from and managed in collaboration with Mosaic and the Port Tampa Bay.

Two colony locations, Duke North and Duke South in Polk County, identified during the 2023 survey, were located greater than 0.5 miles from Mosaic holdings and have been included in the survey due to a) the presence of nesting wood storks, and b) the close proximity of the two locations (**Figure 3; Tables 1 and 2**). No single, isolated nests of listed wading bird species were detected during the survey.

4.2 COLONY SIZE

Active colonies ranged in size from <50 nests to 500-1,000 nests with confidence levels ranging from medium to high (**Table 2**). Fifteen of the 33 active colonies (45.5%) contained 50-250 nests while eleven active colonies (33.3%) contained <50 nests (**Table 2**). Six active colonies (18.2 %) contained 250-500 nests, and one active colony (Duke North) contained 500-1,000 nests (**Table 2**).

4.3 SPECIES COMPOSITION

The presence of any colonial wading bird species (including some considered waterbirds) known to breed in inland Florida observed at a colony location was recorded regardless of whether breeding was confirmed. Of the 17 target wading bird species identified in Section 3.2.3, 16 were detected during the survey with a high confidence level (**Table 3**).

One species not identified during the survey was the least bittern (*Ixobrychus exilis*), arguably one of the least colonial wading bird species targeted (**Table 3**). Anhinga (*Anhinga anhinga*) and western cattle-egret (*Ardea ibis*) were the most commonly detected species in active colonies with anhinga occuring in 27 (81.8%) colonies and western cattle-egret occuring in 25 (75.8%) colonies. Brown pelican (*Pelecanus occidentalis*) and yellow-crowned night heron (*Nyctanassa violacea*) were the least commonly detected species in active colonies each occuring only once (3.0%) (**Table 3; Appendix A**). Brown pelicans are a recent and rare breeder inland, only being documented breeding for the first time in 1991 on Lake Okeechobee. Breeding was subsequently documented in Polk County (Greenlaw et al. 2014). No definitive evidence of brown pelican nesting was observed during the survey. Yellow-crowned night herons are secretive and chiefly coastal nesters in the state of Florida, nesting both colonially and alone. No definitive evidence of yellow-crowned night herons nesting was observed during the survey.

The presence and/or nesting of listed or unexpected species at a colony was noted in the **Table 1**. Four Federally or State Threatened wading bird species were detected at active colonies (**Table 3**). These included wood stork (*Mycteria americana*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta*

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tricolor), and roseate spoonbill (*Platalea ajaja*). Federally-Threatened wood storks were detected nesting at three locations, 616039 / Mulberry Northeas), Duke North, and Kovacs. (**Figures 3 and 4; Tables 1 and 3; Appendix A**). At the time of the survey, 616039 / Mulberry Northeast had approximately 90 active nests, Kovacs had approximately 30 active nests, and Duke North had approximately 35 active nests (**Table 1**). State-Threatened little blue herons were detected at 17 of the 33 (51.5%) active colonies and in most cases included active nests and/or juveniles that recently left the nest (**Table 3**). State threatened tricolored herons were detected at 11 of the 33 (33.3%) active colonies and in most cases included active nests and/or juveniles that recently left the nest (**Table 3**). State-threatened roseate spoonbills, including juveniles that had left the nest, were detected at 2 of the 33 active colonies (6.1%) (**Table 3; Appendix A**). Roseate spoonbills were nesting at both colonies where they were detected (616039 / Mulberry Northeast and PR1 / 616042).

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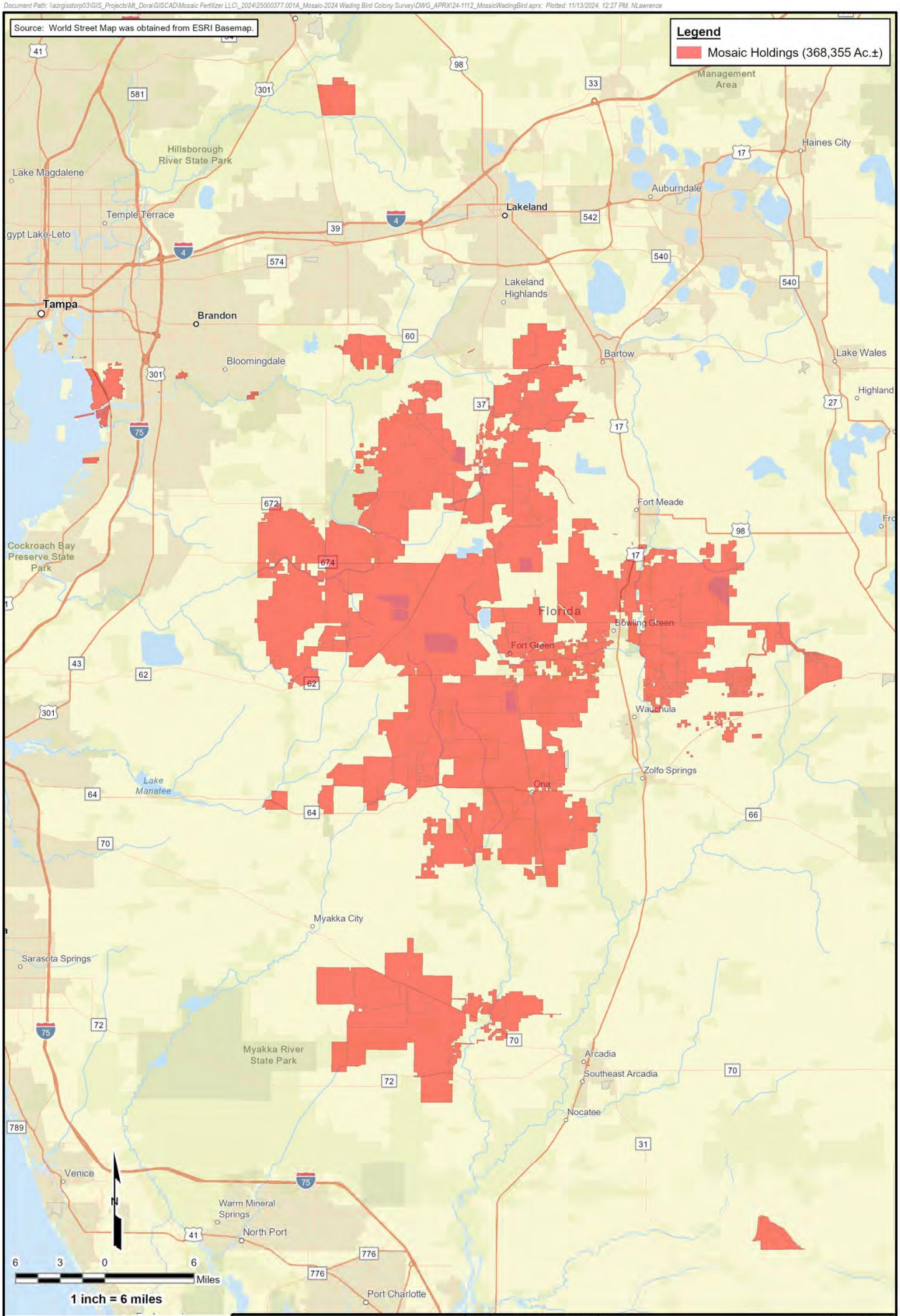
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FIGURES

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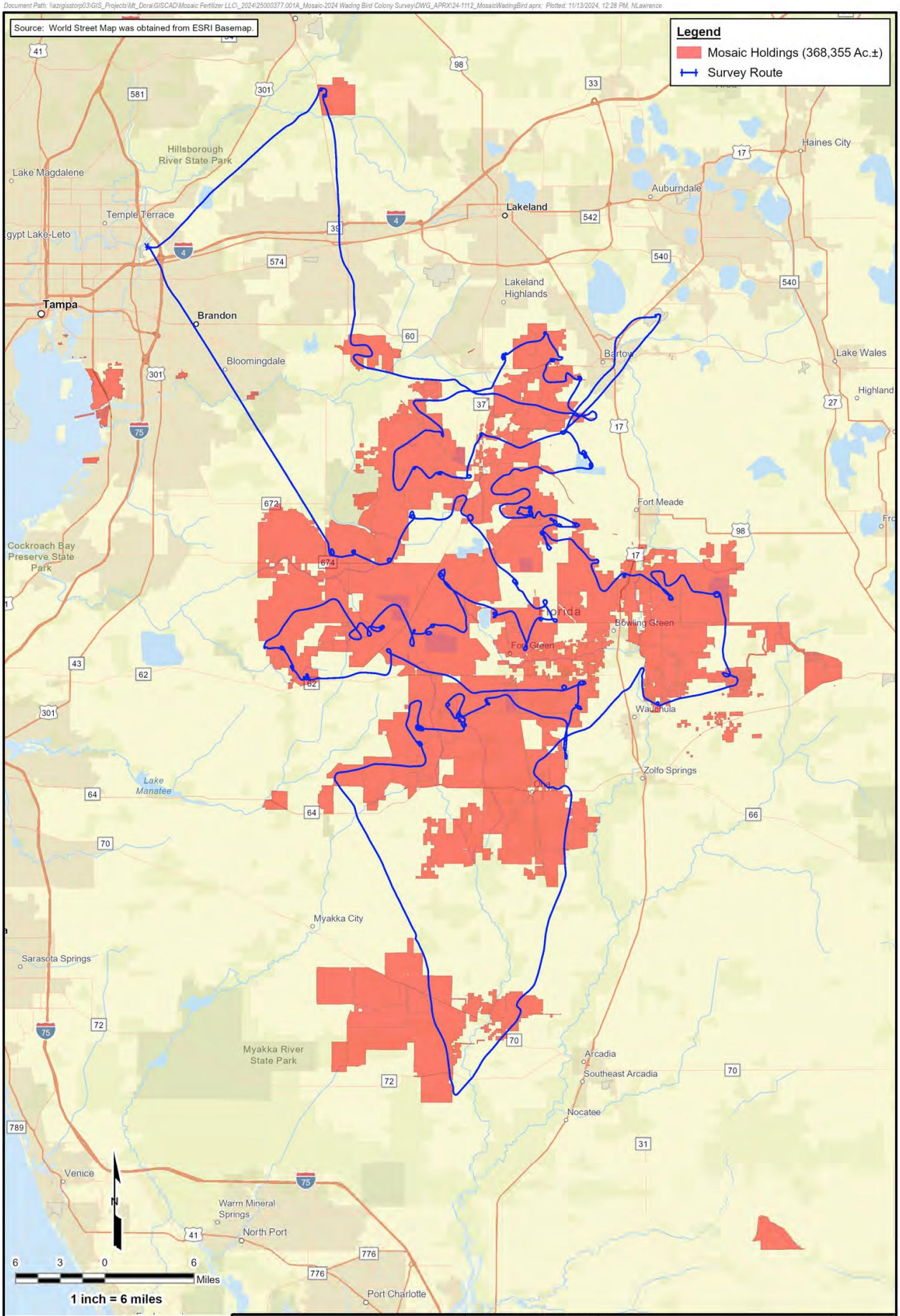
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FILE NAME:	24-1112_MosaicWadingBird.aprx

Location Map

Mosaic Fertilizer, LLC
2024 Wading Bird Colony Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco, and Polk Counties, Florida

FIGURE
1



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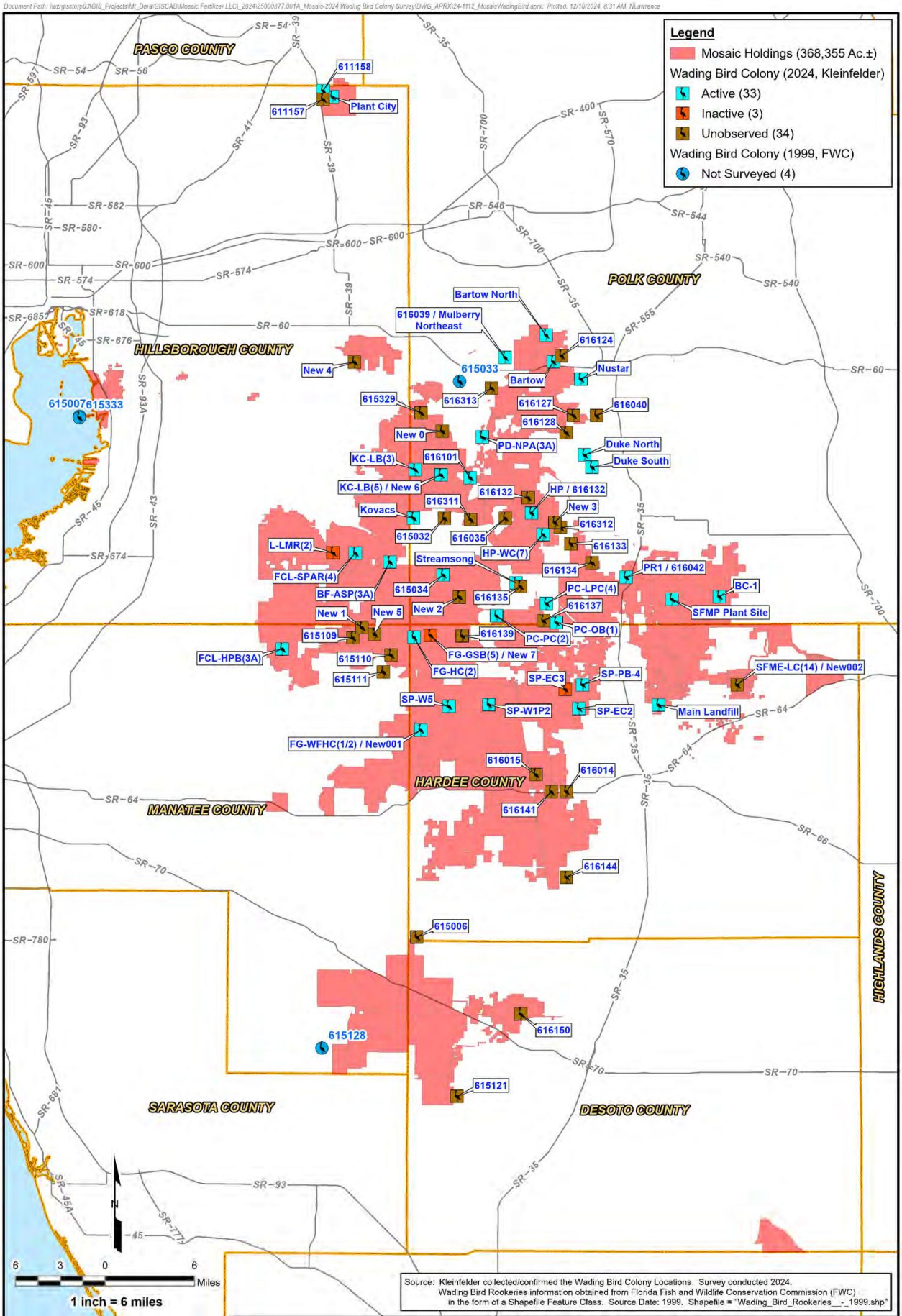
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Survey Route Map

Mosaic Fertilizer, LLC
2024 Wading Bird Colony Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco, and Polk Counties, Florida

FIGURE
2

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Source: Kleinfelder collected/confirmed the Wading Bird Colony Locations. Survey conducted 2024. Wading Bird Rookeries information obtained from Florida Fish and Wildlife Conservation Commission (FWC) in the form of a Shapefile Feature Class. Source Date: 1999. Shapefile = "Wading_Bird_Rookeries__-_1999.shp"

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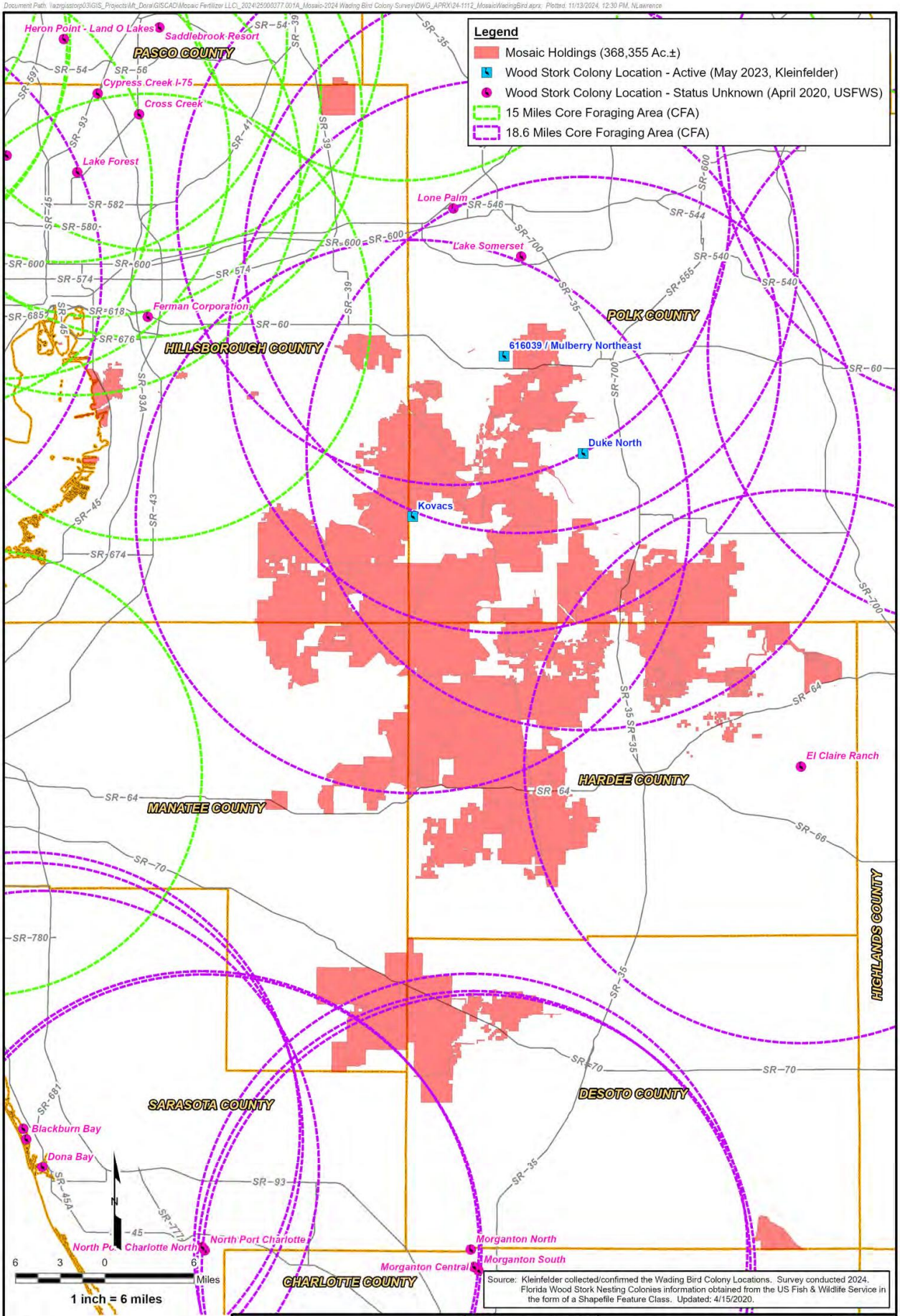
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2024 Wading Bird Colony Location Map

Mosaic Fertilizer, LLC
2024 Wading Bird Colony Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco, and Polk Counties, Florida

FIGURE
3

Document Path: \\azrgisstorp03\GIS_Projects\Mt_Dora\GISCAD\Mosaic Fertilizer LLC_2024\25000377.001A_Mosaic-2024 Wading Bird Colony Survey\DWG_APRX\24-1112_MosaicWadingBird.aprx, Plotted: 11/13/2024, 12:30 PM, NLawrence



Source: Kleinfelder collected/confirmed the Wading Bird Colony Locations. Survey conducted 2024. Florida Wood Stork Nesting Colonies information obtained from the US Fish & Wildlife Service in the form of a Shapefile Feature Class. Updated: 4/15/2020.

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2024 Wood Stork Colony Location Map

Mosaic Fertilizer, LLC
2024 Wading Bird Colony Activity Status Survey
DeSoto, Hardee, Hillsborough, Manatee, Pasco, and Polk Counties, Florida

FIGURE
4

TABLES

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TABLE 1. 2024 WADING BIRD COLONY ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	Activity Status	Observations
611157	Hillsborough	Unobserved	No evidence of past or present colony observed during 2024 survey. New active colony (Plant City) located on-site approximately 1,200 feet northeast.
611158	Hillsborough	Active	Colony located in impoundment associated with the Plant City Facility. At time of 2024 survey, colony was entirely composed of anhinga nests.
615006	Hardee	Unobserved	No evidence of past or present colony observed during 2024 survey.
615032	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
615034	Polk	Active	Colony located in mined phosphate land. At time of the 2024 survey, colony was composed of anhinga and great blue heron nests.
615109	Manatee	Unobserved	No evidence of past or present colony observed during 2024 survey.
615110	Manatee	Unobserved	No evidence of past or present colony observed during 2024 survey.
615111	Manatee	Unobserved	No evidence of past or present colony observed during 2024 survey.
615121	DeSoto	Unobserved	No evidence of past or present colony observed during 2024 survey.
615329	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616014	Hardee	Unobserved	No evidence of past or present colony observed during 2024 survey.
616015	Hardee	Unobserved	No evidence of past or present colony observed during 2024 survey.
616035	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616039 / Mulberry Northeast	Polk	Active	Colony located off-site on spoil islands in former phosphate land closed in 1984 and since repurposed as a wetland treatment system by City of Lakeland. At time of 2024 survey, colony was primarily composed of wood stork and double-crested cormorant nests, and included one roseate spoonbill nest. Approximately 90 active wood storks nests recorded during 2024 survey.
616040	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.

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MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	Activity Status	Observations
616101	Polk	Active	Colony located off-site on islands in artificial lake. At time of 2024 survey, colony was primarily composed of great egret nests, and included tricolored heron nests.
616124	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616127	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616128	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616132	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616133	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616134	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616135	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey. Location was former phosphate land reclaimed in 2007 and converted to golf course in 2012. New active colony (Streamsong) located approximately 0.4 miles northwest.
616137	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616139	Hardee	Unobserved	No evidence of past or present colony observed during 2024 survey.
616141	Hardee	Unobserved	No evidence of past or present colony observed during 2024 survey.
616144	Hardee	Unobserved	No evidence of past or present colony observed during 2024 survey.
616150	DeSoto	Unobserved	No evidence of past or present colony observed during 2024 survey.
616311	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616312	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
616313	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.

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2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
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Colony ID	County	Activity Status	Observations
Bartow	Polk	Active	Colony observed for first time during 2023 survey. Colony located on islands in South Bear Branch adjacent to Bartow Facility. At time of 2024 survey, colony consisted primarily of white ibis and great egret nests, and included little blue heron and tricolored heron nests.
Bartow North*	Polk	Active	Colony observed for the first time during 2024 survey. Colony located on island in artificial lake on phosphate land. At time of the 2024 survey, colony was entirely composed of great blue heron nests.
BC-1*	Polk	Active	Colony observed for first time during 2024 survey. Colony located in clay settling area. At time of 2024 survey, colony was primarily composed of western cattle-egret nests, and included tricolored heron and little blue heron nests.
BF-ASP(3A)	Hillsborough	Active	Colony identified by Mosaic staff and consultants, and surveyed for first time during 2023 survey. Colony located in cypress trees in littoral zone of artificial lake on reclaimed phosphate land. At time of 2024 survey, colony was primarily composed of western cattle-egret nests.
Duke North	Polk	Active	Colony observed for first time during 2023 survey. Colony located off-site on spoil islands in former phosphate land approximately 1,700 feet southwest of historic colony location 616129 (not surveyed). At time of 2024 survey, colony was primarily composed of double-crested cormorant and wood stork nests. Approximately 30 active wood storks nests recorded during 2024 survey.
Duke South	Polk	Active	Colony observed for first time during 2023 survey. Colony located off-site on spoil islands in former phosphate land converted to power plant cooling ponds and located approximately 3,800 feet northwest of historic colony location 616041 (not surveyed). At time of 2024 survey, colony was primarily composed of double-crested cormorant nests. Two juvenile brown pelicans were present but no nesting activity was observed.

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TABLE 1. 2024 WADING BIRD COLONY ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	Activity Status	Observations
FCL-HPB(3A)*	Manatee	Active	Colony observed for first time during 2024 survey. Colony located on spoil island in mined phosphate land. At time of 2024 survey, colony was entirely composed of double crested cormorant and anhinga nests.
FCL-SPAR(4)	Hillsborough	Active	Colony observed for first time during 2023 survey. Colony located in willows within clay settling area constructed in 2013 on mined phosphate land. At time of 2024 survey, colony was primarily composed of double crested cormorant nests, and included little blue heron nests.
FG-GSB(5) / New 7	Hardee	Inactive	Colony previously located on islands in clay settling area constructed in 2004 on mined phosphate land. At time of the 2024 survey, the site was inactive.
FG-HC(2)*	Hardee	Active	Colony observed for first time during 2024 survey. Colony located on spoil islands in artificial lake reclaimed from mined phosphate land between 1999 and 2003. At time of 2024 survey, colony was primarily composed of great egret nests.
FG-WFHC(1/2) / New001	Hardee	Active	Colony identified by Mosaic consultants in 2018, and surveyed for first time during 2023 survey. Colony located on spoil islands in phosphate land mined between 1999 and 2003. At time of 2024 survey, colony was primarily composed of double-crested cormorant and great egret nests, and included little blue heron and tricolored heron nests.
HP / 616132	Polk	Active	Colony located on spoil islands in phosphate land mined between 1999 and 2003. At time of 2024 survey, colony was primarily composed of white ibis nests, and included tricolored heron nests.
HP-WC(7)	Polk	Active	Colony observed for first time during 2023 survey. Colony located on spoil islands in artificial lake surrounded by reclaimed phosphate land. At time of 2024 survey, colony was primarily composed of western cattle-egret nests, and included little blue heron and tricolored heron nests.

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TABLE 1. 2024 WADING BIRD COLONY ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	Activity Status	Observations
KC-LB(3)	Polk	Active	Colony observed for first time during 2023 survey. Colony located on spoil islands in artificial lake on phosphate land. At time of 2024 survey, the colony consisted of western cattle-egret and great egret nests.
KC-LB(5) / New 6	Polk	Active	Colony located on spoil island in artificial lake on phosphate land. At time of 2024 survey, the colony was primarily composed of great egret and western cattle-egret nests, and included little blue heron nests.
Kovacs	Polk	Active	Colony observed for first time during 2023 survey. Colony located off-site on island in former phosphate land. At time of 2024 survey, colony was primarily composed of great egret and wood stork nests. Approximately 30 active wood stork nests recorded during 2024 survey.
L-LMR(2)	Hillsborough	Inactive	Colony observed for the first time during 2023 survey. Colony previously located on islands in clay settling area constructed in 2006 on mined phosphate land. At time of 2024 survey, site was inactive.
Main Landfill*	Hardee	Active	Colony observed for first time during 2024 survey. Colony located off-site in impoundments associated with landfill. At time of 2024 survey, colony was composed great egret nests. Little blue herons were present.
New 0	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey.
New 1	Manatee	Unobserved	No evidence of past or present colony observed during 2024 survey. Formerly a clay settling area, mining occurred between 2017 and 2023.
New 2	Polk	Unobserved	No evidence of past or present colony observed during 2024 survey. Area mined between 2011 and 2013.
New 3	Polk	Unobserved	No evidence of past or present colony observed during 2023 survey.
New 4	Hillsborough	Unobserved	No evidence of past or present colony observed during 2024 survey.
New 5	Manatee	Unobserved	No evidence of past or present colony observed during 2024 survey. Formerly a clay settling area, mining occurred between 2017 and 2023.
Nustar	Polk	Active	Colony observed for first time during 2023 survey. Colony located on spoil islands in impoundment on phosphate land. At time of 2024 survey, colony was primarily composed of great egret nests.

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TABLE 1. 2024 WADING BIRD COLONY ACTIVITY STATUS AND OBSERVATIONS
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
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Colony ID	County	Activity Status	Observations
PC-LPC(4)	Polk	Active	Colony observed for first time during 2023 survey. Colony located on island in artificial lake on reclaimed phosphate land. At time of 2024 survey, colony was primarily composed of western cattle-egret and great egret nests.
PC-OB(1)	Polk	Active	Colony observed for first time during 2023 survey. Colony located on island in lake. At time of 2024 survey, colony was primarily composed of great egret and double-crested cormorant nests.
PC-PC(2)	Polk	Active	Colony identified by Mosaic staff and consultants, and surveyed for first time during 2023 survey. Colony located in cypress trees within reclaimed wetlands on phosphate land. At time of 2024 survey, colony was composed of great blue heron, great egret, anhinga, and western cattle-egret nests.
PD-NPA(3A)	Polk	Active	Colony observed for first time during 2023 survey. Colony located on island in lake. At time of 2024 survey, colony was primarily composed of anhinga and great egret nests, and included little blue heron nests.
Plant City	Hillsborough	Active	Colony observed for first time during 2023 survey. Colony located on artificial islands in impoundment associated with Plant City Facility. At time of 2024 survey, colony was primarily composed of anhinga and western cattle-egret nests.
PR1 / 616042	Polk	Active	Colony located on artificial island in reclaimed phosphate land in Mosaic Fish Management Area. At time of 2024 survey, colony was primarily composed of white ibis, western cattle-egret, and great egret nests, and included roseate spoonbill, little blue heron, and tricolored heron nests.
SFME-LC(14) / New002	Hardee	Unobserved	Colony identified by Mosaic staff and consultants in 2018. Colony previously located in Brazilian pepper in small reservoir surrounded by citrus groves. Take of colony conducted October 2022 as conditioned in FWC Migratory Bird Nest Removal Permit No. LSNR-20-00216.

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TABLE 1. 2024 WADING BIRD COLONY ACTIVITY STATUS AND OBSERVATIONS
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Colony ID	County	Activity Status	Observations
SFMP Plant Site*	Polk	Active	Colony observed for first time during 2024 survey. Colony located in phosphate land mined between 1994 and 1999. At time of 2024 survey, colony was primarily composed of great egret and western cattle-egret nests, and included little blue heron nests.
SP-EC2	Hardee	Active	Colony observed for first time during 2023 survey. Colony located in willows within clay settling area constructed prior to 2016 on mined phosphate land. At time of 2024 survey, colony was entirely composed of anhinga and double-crested cormorant nests.
SP-EC3	Hardee	Inactive	Colony observed for first time during 2023 survey. Colony previously located on spoil island in phosphate land mined between 2015 and 2016. At time of 2024 survey, site was inactive.
SP-PB-4	Hardee	Active	Colony observed for first time during 2023 survey. Colony located on spoil islands in phosphate land mined between 2013 and 2014. At time of 2024 survey, colony was primarily composed of western cattle-egret nests, and included little blue heron nests.
SP-W1P2	Hardee	Active	Colony observed for first time during 2023 survey. Colony located on spoil islands in clay settling area constructed prior to 1999 on phosphate land. At time of 2024 survey, colony was primarily composed of western cattle-egret nests, and included little blue heron and tricolored heron nests.
SP-W5	Hardee	Active	Colony observed for first time during 2023 survey. Colony located on island in clay settling area constructed between 2007 and 2009 on mined phosphate land. At time of 2024 survey, colony included little blue heron and tricolored heron nests.
Streamsong*	Polk	Active	Colony observed for first time during 2023 survey. Colony located off-site on island in artificial water feature constructed between 2004 and 2005 on phosphate land. At time of 2024 survey, colony was primarily composed of western cattle-egret and anhinga nests.

*First observed during 2024 survey

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TABLE 2. WADING BIRD COLONY ACTIVITY HISTORY
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	1970s[1]	1980s[1]	1990s[1]	2011[1]	2012[1]	2023	2024
		Status	Status	Status	Status	Status	Status	Status
		Size	Size	Size; Confidence	Size	Size	Size; Confidence	Size; Confidence
611157	Hillsborough	Unknown	Active NA	Inactive	Not Surveyed	Not Surveyed	Unobserved	Unobserved
611158	Hillsborough	Unknown	Active NA	Inactive	Not Surveyed	Not Surveyed	Unobserved	Active <50; High
615006	Hardee	Active NA	Active NA	Not Surveyed	Not Surveyed	Not Surveyed	Unobserved	Unobserved
615007	Hillsborough	Active NA	Active NA	Active >3,000; High	Not Surveyed	Not Surveyed	Not Surveyed	Not Surveyed
615032	Polk	Active NA	Inactive	Inactive	Unobserved	Active 250-500	Not Surveyed	Unobserved
615033	Polk	Active NA	Inactive	Inactive	Inactive	Inactive	Not Surveyed	Not Surveyed
615034	Polk	Active NA	Inactive	Active <50; NA	Active 250-500	Inactive	Unobserved	Active <50; High
615109	Manatee	Unknown	Active NA	Inactive	Inactive	Active 250-500	Unobserved	Unobserved
615110	Manatee	Unknown	Active NA	Inactive	Inactive	Inactive	Unobserved	Unobserved
615111	Manatee	Unknown	Active NA	Inactive	Active <50	Inactive	Unobserved	Unobserved
615121	DeSoto	Unknown	Active NA	Inactive	Inactive	Inactive	Unobserved	Unobserved
615128	Manatee	Unknown	Active NA	Inactive	Unobserved	Inactive	Not Surveyed	Not Surveyed
615329	Polk	Unknown	Unknown	Active 1,000-3,000; High	Inactive	Active <50	Unobserved	Unobserved
615333	Hillsborough	Unknown	Unknown	Active 25-500; High	Not Surveyed	Not Surveyed	Not Surveyed	Not Surveyed
616014	Hardee	Active NA	Inactive	Inactive	Inactive	Inactive	Unobserved	Unobserved

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2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
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Colony ID	County	1970s[1]	1980s[1]	1990s[1]	2011[1]	2012[1]	2023	2024
		Status	Status	Status	Status	Status	Status	Status
		Size	Size	Size; Confidence	Size	Size	Size; Confidence	Size; Confidence
616015	Hardee	Active	Inactive	Inactive	Inactive	Inactive	Unobserved	Unobserved
		NA						
616035	Polk	Active	Inactive	Inactive	Active	Active	Unobserved	Unobserved
		NA			1,000-3,000	50-250		
616039 / Mulberry Northeast	Polk	Active	Inactive	Inactive	Active	Active	Active	Active
		NA			250-500	>3,000	250-500; Medium	250-500; High
616040	Polk	Active	Inactive	Inactive	Inactive	Inactive	Unobserved	Unobserved
		NA						
616101	Polk	Unknown	Active	Active	Active	Active	Active	Active
			NA	250-500	1,000-3,000	500-1,000	50-250; High	250-500; Medium
616124	Polk	Unknown	Active	Not Surveyed	Inactive	Active	Unobserved	Unobserved
			NA			50-250		
616127	Polk	Unknown	Active	Inactive	Unobserved	Active	Unobserved	Unobserved
			NA			<50		
616128	Polk	Unknown	Active	Inactive	Unobserved	Active	Unobserved	Unobserved
			NA			<50		
616132	Polk	Unknown	Active	Active	Unobserved	Active	Unobserved	Unobserved
			NA			1,000-3,000		
616133	Polk	Unknown	Active	Inactive	Unobserved	Inactive	Unobserved	Unobserved
			NA					
616134	Polk	Unknown	Active	Inactive	Inactive	Active	Unobserved	Unobserved
			NA			<50		
616135	Polk	Unknown	Inactive	Inactive	Unobserved	Inactive	Unobserved	Unobserved
616137	Polk	Unknown	Active	Inactive	Inactive	Active	Unobserved	Unobserved
			NA			250-500		
616139	Hardee	Unknown	Active	Active	Inactive	Inactive	Unobserved	Unobserved
			NA	>3,000; High				
616141	Hardee	Unknown	Active	Inactive	Inactive	Inactive	Unobserved	Unobserved
			NA					

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MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	1970s[1]	1980s[1]	1990s[1]	2011[1]	2012[1]	2023	2024
		Status	Status	Status	Status	Status	Status	Status
		Size	Size	Size; Confidence	Size	Size	Size; Confidence	Size; Confidence
616144	Hardee	Unknown	Active NA	Not Surveyed	Not Surveyed	Not Surveyed	Unobserved	Unobserved
616150	DeSoto	Unknown	Active NA	Inactive	Inactive	Inactive	Unobserved	Unobserved
616311	Polk	Unknown	Unknown	Active <50; High	Unobserved	Inactive	Unobserved	Unobserved
616312	Polk	Unknown	Unknown	Active 250-500; High	Active <50	Active <50	Unobserved	Unobserved
616313	Polk	Unknown	Unknown	Active 250-500; High	Active 1,000-3,000	Active <50	Unobserved	Unobserved
Bartow	Polk	-	-	-	-	-	Active <50; Medium	Active 250-500; High
Bartow North*	Polk	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Active <50; High
BC-1*	Polk	-	-	-	-	-	Unobserved	Active 250-500; Medium
BF-ASP(3A)	Hillsborough	-	-	-	-	-	Active <50; High	Active 50-250; High
Duke North	Polk	-	-	-	-	-	Active 500-1,000; Medium	Active 500-1,000; Medium
Duke South	Polk	-	-	-	-	-	Active 50-250; High	Active 50-250; High
FCL-HPB(3A)*	Manatee	-	-	-	-	-	Unobserved	Active <50; High
FCL-SPAR(4)	Hillsborough	-	-	-	-	-	Active 50-250; High	Active 50-250; Medium
FG-GSB(5)/ New 7	Hardee	-	-	-	Not Surveyed	Active >3,000	Active <50; Medium	Inactive
FG-HC(2)*	Hardee	-	-	-	-	-	Unobserved	Active <50; High

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MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
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Colony ID	County	1970s[1]	1980s[1]	1990s[1]	2011[1]	2012[1]	2023	2024
		Status	Status	Status	Status	Status	Status	Status
		Size	Size	Size; Confidence	Size	Size	Size; Confidence	Size; Confidence
FG-WFHC(1/2) / New001	Hardee	-	-	-	-	-	Active	Active
							50-250; High	50-250; High
HP / 616132	Polk	Unknown	Active	Active	Unobserved	Active	Active	Active
			NA	250-500; High		1,000-3,000	50-250; Medium	50-250; High
HP-WC(7)	Polk	-	-	-	-	-	Active	Active
							<50; Medium	50-250; Medium
KC-LB(3)	Polk	-	-	-	-	-	Active	Active
							<50; High	<50; High
KC-LB(5) / New 6	Polk	-	-	-	Not Surveyed	Active	Active	Active
						500-1,000	<50; High	50-250; Medium
Kovacs	Polk	-	-	-	-	-	Active	Active
							50-250; High	50-250; High
L-LMR(2)	Hillsborough	-	-	-	-	-	Active	Inactive
							50-250; High	
Main Landfill*	Hardee	-	-	-	-	-	Unobserved	Active
								<50; High
New 0	Polk	-	-	-	Active	Active	Unobserved	Unobserved
					1,000-3,000	1,000-3,000		
New 1	Manatee	-	-	-	Active	Inactive	Unobserved	Unobserved
					1,000-3,000			
New 2	Polk	-	-	-	Inactive	Inactive	Unobserved	Unobserved
New 3	Polk	-	-	-	Inactive	Inactive	Unobserved	Unobserved
New 4	Hillsborough	-	-	-	Not Surveyed	Active	Unobserved	Unobserved
						50-250		
New 5	Manatee	-	-	-	Not Surveyed	Active	Unobserved	Unobserved
						<50		
Nustar	Polk	-	-	-	-	-	Active	Active
							50-250; High	50-250; High

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MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	County	1970s[1]	1980s[1]	1990s[1]	2011[1]	2012[1]	2023	2024
		Status	Status	Status	Status	Status	Status	Status
		Size	Size	Size; Confidence	Size	Size	Size; Confidence	Size; Confidence
PC-LPC(4)	Polk	-	-	-	-	-	Active	Active
							<50; High	50-250; High
PC-OB(1)	Polk	-	-	-	-	-	Active	Active
							50-250; High	50-250; High
PC-PC(2)	Polk	-	-	-	-	-	Active	Active
							<50; High	<50; High
PD-NPA(3A)	Polk	-	-	-	-	-	Active	Active
							<50; High	<50; High
Plant City	Hillsborough	-	-	-	-	-	Active	Active
							<50; High	<50; High
PR1 / 616042	Polk	Active	Active	Inactive	Active	Active	Active	Active
		NA	NA		1,000-3,000	>3,000	50-250; Medium	50-250; High
SFME-LC(14) / New002	Hardee	-	-	-	-	-	Unobserved	Unobserved
SFMP Plant Site*	Polk	-	-	-	-	-	Unobserved	Active
								250-500; High
SP-EC2	Hardee	-	-	-	-	-	Active	Active
							50-250; Medium	50-250; Medium
SP-EC3	Hardee	-	-	-	-	-	Active	Inactive
							<50; High	
SP-PB-4	Hardee	-	-	-	-	-	Active	Active
							50-250; High	50-250; High
SP-W1P2	Hardee	-	-	-	-	-	Active	Active
							50-250; High	250-500; High
SP-W5	Hardee	-	-	-	-	-	Active	Active
							50-250; Medium	50-250; High
Streamsong*	Polk	-	-	-	-	-	Unobserved	Active
								<50; Medium

[1]Data obtained from Cardno Wading Bird Colony Status Report (2011 and 2012 Nesting Seasons) and FWC Historic Waterbird Colony Locator.

*First observed during 2024 survey

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TABLE 3. WADING BIRD COLONY SPECIES COMPOSITION
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
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Colony ID	WOST[1]	ANHI	DCCO	WHIB	GLIB	ROSP[2]	YCNH	BCNH	LBHE[2]	TRHE[2]	SNEG	GRHE	WECE	GREG	GBHE	BRPE	Confidence	TOTAL
611158		X															High	1
615034		X													X		High	2
616039 / Mulberry Northeast	X	X	X	X		X			X		X		X	X	X		High	10
616101		X	X	X	X			X	X	X	X	X	X		X		High	11
Bartow			X	X	X			X	X	X	X		X	X			High	9
Bartow North*															X		High	1
BC-1*		X			X			X	X	X	X			X	X		High	8
BF-ASP(3A)		X									X		X	X	X		High	5
Duke North	X	X	X								X			X			High	5
Duke South		X	X					X			X			X	X	X	High	7
FCL-HPB(3A)*		X	X												X		High	3
FCL-SPAR(4)		X	X						X		X		X		X		High	6
FG-HC(2)*				X				X			X		X		X		High	5
FG-WFHC(1/2) / New001		X	X	X	X			X	X	X			X	X	X		High	10
HP / 616132		X	X	X						X	X	X	X		X		High	8
HP-WC(7)		X	X					X	X	X	X		X	X			High	8

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TABLE 3. WADING BIRD COLONY SPECIES COMPOSITION
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
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Colony ID	WOST[1]	ANHI	DCCO	WHIB	GLIB	ROSP[2]	YCNH	BCNH	LBHE[2]	TRHE[2]	SNEG	GRHE	WECE	GREG	GBHE	BRPE	Confidence	TOTAL
KC-LB(3)													X	X			High	2
KC-LB(5) / New 6		X			X				X	X			X				High	5
Kovacs	X	X	X										X	X	X		High	6
Main Landfill*									X					X			High	2
Nustar		X	X	X	X					X	X		X	X	X		High	9
PC-LPC(4)		X		X	X		X						X	X	X		High	7
PC-OB(1)		X	X								X		X	X	X		High	6
PC-PC(2)		X											X	X	X		High	4
PD-NPA(3A)		X	X		X				X				X	X			High	6
Plant City		X			X							X	X				High	4
PR1 / 616042		X	X	X	X	X			X	X			X	X	X		High	10
SFMP Plant Site*		X	X		X				X		X		X	X	X		High	8
SP-EC2		X	X	X					X				X	X			High	6
SP-PB-4					X				X				X	X			High	4
SP-W1P2		X	X		X				X	X	X		X	X	X		High	9
SP-W5		X			X			X	X	X	X		X	X			High	8

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TABLE 3. WADING BIRD COLONY SPECIES COMPOSITION
MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024

Colony ID	WOST[1]	ANHI	DCCO	WHIB	GLIB	ROSP[2]	YCNH	BCNH	LBHE[2]	TRHE[2]	SNEG	GRHE	WECE	GREG	GBHE	BRPE	Confidence	TOTAL
Streamsong*		X		X				X	X				X	X	X		High	7
TOTAL:	3	27	18	11	14	2	1	9	17	11	16	3	25	23	21	1		

[1]Federally Threatened
[2]State Threatened
*First observed during 2024 survey

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APPENDICES

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APPENDIX A – PHOTOGRAPHIC DOCUMENTATION

MOSAIC FERTILIZER, LLC
2024 WADING BIRD COLONY ACTIVITY STATUS SURVEY
APRIL 2024



611158



615034



616039 / Mulberry Northeast



616039 / Mulberry Northeast
Wood Stork Nesting



616039 / Mulberry Northeast
Roseate Spoonbill and Wood Stork Nesting



616101



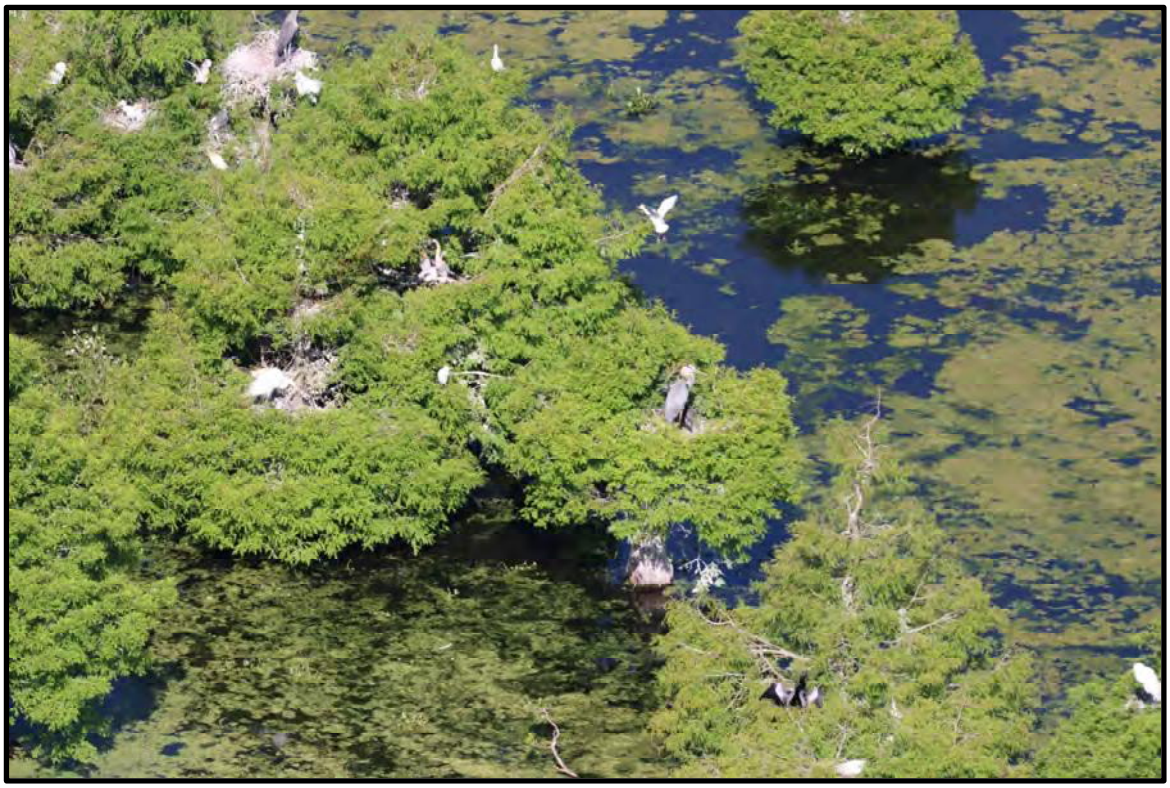
Bartow



Bartow North



BC-1



BF-ASP(3A)



Duke North



Duke North
Wood Stork Nesting



Duke South



Duke South
Juvenile Brown Pelican



FCL-HPB(3A)



FCL-SPAR(4)



FG-GSB(5) / New 7



FG-HC(2)



FG-WFHC(1/2) / New001



HP / 616132



HP-WC(7)



KC-LB(3)



KC-LB(5) / New 6



Kovacs



Kovacs
Wood Stork Nesting



L-LMR(2)



Main Landfill



Nustar



PC-LPC(4)



PC-OB(1)



PC-PC(2)



PD-NPA(3A)



Plant City



PR1 / 616042



PR1 / 616042
Roseate Spoonbills



SFMP Plant Site



SP-EC2



SP-EC3



SP-PB-4



SP-W1P2



SP-W5



Streamsong

Native Threatened Species Recovery – Threatened Wildlife Migratory Birds

Permit Number TE051429-8
(January 2025)



Prepared for:

United States Fish & Wildlife Service
Migratory Bird Permit Office
1875 Century Boulevard, NE
Atlanta, Georgia 30345

Prepared by:

Mosaic™

INTRODUCTION

In accordance with the specific authorizations and conditions (Condition L) of Permit Number TE051429-8, the following table provides the list of 79 banded Florida Scrub-Jays and sex (if known) completed in 2024. Additional sex information will be available once genetic sexing has been completed from blood samples. In addition, the annual report submitted as part of Mosaic's Habitat Conservation Plan – Incidental Take Permit (No. TE236128) provides all the other information and specific details relating to Mosaic's long-term monitoring of Florida scrub-jays.

FEDERAL ID	COLOR ID	SEX	YEAR CLASS	NATAL GROUP	PROPERTY
1873-45001	ZA-KW	Unknown	2024	DP10F	Duette Preserve
1873-45002	ZA-KO	Unknown	2024	DP10F	Duette Preserve
1873-45003	ZA-KY	Unknown	2024	DP10F	Duette Preserve
1873-45004	ZB-KL	Unknown	2024	DP1I	Duette Preserve
1873-45005	ZB-KG	Unknown	2024	DP1I	Duette Preserve
1873-45006	ZB-KA	Unknown	2024	DP1I	Duette Preserve
1873-45007	ZB-KB	Female	2024	DP1I	Duette Preserve
1873-45008	ZG-KA	Unknown	2024	DP1J	Duette Preserve
1873-45009	ZG-KB	Unknown	2024	DP1J	Duette Preserve
1873-45010	ZG-KG	Unknown	2024	DP1J	Duette Preserve
1873-45011	ZP-KA	Unknown	2024	NBEKERA	Wingate Beker State Park
1873-45012	ZP-KB	Unknown	2024	NBEKERA	Wingate Beker State Park
1873-45013	ZP-KG	Unknown	2024	NBEKERA	Wingate Beker State Park
1873-45014	ZP-KO	Unknown	2024	NBEKERA	Wingate Beker State Park
1873-45015	ZP-KY	Unknown	2024	NCOKERB	Coker Tract
1873-45016	ZP-KW	Unknown	2024	NCOKERB	Coker Tract
1873-45017	ZA-KD	Unknown	2024	NCOKERB	Coker Tract
1873-45018	ZP-KD	Unknown	2024	NCOKERB	Coker Tract
1873-45019	ZB-KR	Unknown	2024	DP10C	Duette Preserve
1873-45020	ZB-KP	Unknown	2024	DP10C	Duette Preserve
1873-45021	ZB-KO	Unknown	2024	DP10C	Duette Preserve
1873-45022	ZB-KY	Unknown	2024	DP10C	Duette Preserve
1873-45023	ZB-KW	Unknown	2024	DP10C	Duette Preserve
1873-45024	ZB-KD	Unknown	2024	DP10C	Duette Preserve
1873-45025	ZG-KL	Unknown	2024	DP3A	Duette Preserve
1873-45026	ZG-KP	Unknown	2024	DP3A	Duette Preserve
1873-45027	ZG-KO	Unknown	2024	DP3A	Duette Preserve
1873-45028	ZG-KR	Unknown	2024	SCOKERA	Coker Tract

FEDERAL ID	COLOR ID	SEX	YEAR CLASS	NATAL GROUP	PROPERTY
1873-45029	ZG-KY	Unknown	2024	SCOKERA	Coker Tract
1873-45030	ZG-KW	Unknown	2024	SCOKERA	Coker Tract
1873-45031	ZG-KD	Unknown	2024	SCOKERA	Coker Tract
1873-45032	ZO-KL	Unknown	2024	SCOKERA	Coker Tract
1873-45033	ZO-KA	Unknown	2024	DP16B	Duette Preserve
1873-45034	ZO-KP	Unknown	2024	DP16B	Duette Preserve
1873-45035	ZO-KR	Unknown	2024	DP16B	Duette Preserve
1873-45036	ZO-KB	Unknown	2024	DP16B	Duette Preserve
1873-45037	ZO-KG	Unknown	2024	DP16B	Duette Preserve
1873-45038	ZO-KO	Unknown	2024	DP36E	Duette Preserve
1873-45039	ZO-KY	Unknown	2024	DP36E	Duette Preserve
1873-45040	ZO-KW	Unknown	2024	DP36E	Duette Preserve
1873-45041	ZY-KL	Unknown	2024	MWU	Mosaic Wellfield
1873-45042	ZY-KP	Unknown	2024	DP21A	Duette Preserve
1873-45043	ZY-KA	Unknown	2024	DP21A	Duette Preserve
1873-45044	ZY-KB	Unknown	2024	DP21A	Duette Preserve
1873-45045	ZY-KG	Unknown	2024	DP36A	Duette Preserve
1873-45046	ZY-KO	Unknown	2024	NCOKERA	Coker Tract
1873-45047	ZY-KY	Unknown	2024	NCOKERA	Coker Tract
1873-45048	ZY-KW	Unknown	2024	NCOKERA	Coker Tract
1873-45049	ZY-KD	Unknown	2024	NCOKERA	Coker Tract
1873-45050	ZW-KL	Unknown	2024	DP12L	Duette Preserve
1873-45051	ZW-KP	Unknown	2024	DP12L	Duette Preserve
1873-45052	ZW-KA	Unknown	2024	DP12L	Duette Preserve
1873-45053	ZW-KB	Unknown	2024	DP12L	Duette Preserve
1873-45054	ZW-KG	Unknown	2024	DP19B	Duette Preserve
1873-45055	ZO-KD	Unknown	2024	DP10E	Duette Preserve
1873-45056	ZW-KO	Unknown	2024	DP36H	Duette Preserve
1873-45057	ZW-KY	Unknown	2024	DP36H	Duette Preserve
1873-45058	ZW-KW	Unknown	2024	DP36H	Duette Preserve
1873-45059	ZW-KD	Unknown	2024	DP36H	Duette Preserve
1873-45060	ZD-KL	Unknown	2024	DP12B	Duette Preserve
1873-45061	ZD-KP	Unknown	2024	DP12B	Duette Preserve
1873-45062	ZD-KA	Unknown	2024	DP12B	Duette Preserve
1873-45063	ZD-KB	Unknown	2024	DP12I	Duette Preserve
1873-45185	ZL-KL	Unknown	2024	DP11C	Duette Preserve
1873-45186	ZL-KP	Unknown	2024	DP41A	Duette Preserve

FEDERAL ID	COLOR ID	SEX	YEAR CLASS	NATAL GROUP	PROPERTY
1873-45187	ZL-KA	Unknown	2024	DP41A	Duette Preserve
1873-45188	ZL-KB	Unknown	2024	DP41A	Duette Preserve
1873-45189	ZL-KG	Unknown	2024	DP41A	Duette Preserve
1873-45190	ZL-KY	Unknown	2024	DP12I	Duette Preserve
1873-45191	ZL-KW	Unknown	2024	DP12I	Duette Preserve
1873-45192	ZP-KL	Unknown	2024	DP43B	Duette Preserve
1873-45193	ZP-KP	Unknown	2024	DP43B	Duette Preserve
1873-45194	ZA-KL	Unknown	2024	DP36H	Duette Preserve
1873-45195	ZA-KP	Unknown	2024	DP36H	Duette Preserve
1873-45196	ZA-KA	Unknown	2024	DP36H	Duette Preserve
1873-45197	ZA-KB	Unknown	2024	DP36H	Duette Preserve
1873-45198	ZL-KD	Unknown	2024	DP12I	Duette Preserve
1873-45199	ZL-KO	Unknown	2024	DP12I	Duette Preserve
1873-45200	ZA-KG	Unknown	2024	DP36B	Duette Preserve

SECTION 3

ANNUAL REPORT OF OPERATIONS AND FINANCIAL RESPONSIBILITY

REPORT OF OPERATIONS

The Mosaic Company

Hillsborough Consolidated Mines

2024/2025 ANNUAL REPORT OF OPERATIONS

ANNUAL REPORT OF MINE OPERATIONS
FOR
THE MOSAIC COMPANY.
HILLSBOROUGH COUNTY CONSOLIDATED MINES

(JULY 1, 2024 THROUGH JUNE 30, 2025)

August 19, 2025

The Mosaic Company ("Mosaic") is submitting its' Annual Report pursuant to the requirements of the Hillsborough County Land Development Code (HCLDC), Section 8.02.10B., governing the annual reviews for compliance with the mining permit conditions imposed on its' Hillsborough County Mine operations.

This report consists of three sections:

- A summary of mine operations for the reporting period
- A summary of 2025/2026 planned mine operations.
- A summary of 2024/2025 clay reporting

Attached are Map 1, Boundary Map, which depicts the DRI 263 mine boundary; Map 2, Previous and Proposed Mining; Map 3, FDEP Reclamation Programs; Map 4, Clay Settling Areas; Map 5, Aerial Photograph; Map 6A, FDEP Reclamation Status and EPC Mitigation Status Map (with LRU Boundaries); Map 6B, FDEP Reclamation Status and EPC Mitigation Status (with Mining Unit Boundaries); Map 7, Hillsborough County Approved Reclamation/Releases.

A table summarizing Mosaic's current financial responsibility is also attached as required by the HCLDC, Section 8.02.10. In addition, the latest available financial statements and information can be downloaded or viewed at www.mosaicco.com under the category of Investors, sub-category financial reporting.

The required HCDS and EPCHC review fees will be made payable to the Hillsborough County Board of Commissioners, as required by the HCLDC and Environmental Protection Commission Rules.

SUMMARY OF MINE OPERATIONS

Four Corners-Lonesome

Phosphate mining continued in Hillsborough County with approximately 37.3 acres being mined during this reporting period. A total of 127.7 acres of EPCHC mitigation related to mining unit approvals and mining were released this reporting year. An additional 86.3 acres of EPCHC mitigation unrelated to mining activities was also released during this reporting period. Clay storage activities continued at FCO F-4, F-5, F-7, L-1, L-2, and L-3 clay settling areas (CSAs).

Kingsford

One mitigation site within the Kingsford area was released by EPCHC during this reporting period and totaled 6.6 acres.

Environmental Monitoring

Environmental monitoring continued throughout the reporting period at all locations as required by the HCLDC and all specific approvals. This data is forwarded to Hillsborough County on a monthly and annual basis. A summary of this information is included with the attached DRI Annual report.

Reclamation Activities Conducted within the 2024-2025 Reporting Period

Contouring

LRUID	ACRES
IMC-FCL-HPB(12)	13.0
IMC-FCL-HUC(1A)	7.0
IMC-FCL-LEB(2)	3.5
IMC-FCL-LEB(3A)	93.4
IMC-LMR(12A)	20.3
IMC-FCL-PB(6)	88.6
IMC-FCL-PB(7)	141.7
Total	**367.5**

Upland Planting

LRUID	ACRES
IMC-FCL-HUC(1A)	2.3
IMC-FCL-LEB(2)	2.5
IMC-FCL-LEB(3A)	63.7
IMC-FCL-PB(6)	85.9
IMC-FCL-PB(7)	116.8
Total	**271.2**

Wetland Planting

LRUID	ACRES
IMC-FCL-HPB(12)	13.0
IMC-FCL-HUC(1A)	4.6
IMC-FCL-LEB(2)	1.0
IMC-FCL-LEB(3A)	29.7
IMC-LMR(12A)	20.3
IMC-FCL-PB(6)	2.6
IMC-FCL-PB(7)	24.8
Total	**96.0**

EPCHC Mitigation Releases to Date (Ending June 30, 2025)

MUID	Wetland ID	Acres
Outside of MU	BASEBALL, Corridor Crossing L, E-1C	60.3
KMU R	B, D, H	31.5
KMU R-A	A, B, C, D	15.6
KMUR A	D	1.2
LMU 13	C, D, E, F, G	26.7
LMU 14	G, H, J	9.2
LMU 16	119, 119A, 123, 123A, P, N, M1	68.9
LMU 17	168	26.2
LMU 19	810	15.2
MU 10	A, B	25.8
MU 11E	A1, B, C, C (North), C (South), E, F, G, H, I, J, M, N	53.4
MU 13	A, B, E, G1, L, M, N, P1, P2, T, U	145.3
MU 13A	1	0.6
MU 14E	15, 16, 3, 5, 12, 14	89.0
MU 15E	1, 11, 12, 25(102)	95.2
MU 17E	7, 10, 12, 13, 16, 26, 27, 56(a), 9, A, B, D, E, F, G, H, I, J, K, L, M, N, O	47.7
MU 19E	305, 306, 339, 961331, Area K Enhancement	73.9
MU 5	C, D	115.1
MU 6	A, B, C, D, E	96.9
MU 7	A, B, C, D, E, F, G, H, I, J, K, M, P&W, L	340.2
MU 8	2, 3, A, B, C, D, E	101.8
MU 8a	1, 2, 3	8.2
MU 9	D, F, G, I	121.5
MU H		9.0
MU K	F	7.5
MU P	B, C, D	13.1
MU S	A, B	16.9
MU T	E	4.0
	Total	**1,619.9**
MU 13	C, K	11.0
MU 18E	W1	1.8
LMU 22	SPAR 022	15.8
LMU 19	784-1, 784-2, 784-3, 785-1, 784-2, 785-3, 787	99.1
MU R	G	6.6
	Total Released by EPCHC 2024-2025	**134.3**
	Grand Total Released by EPCHC	**1,754.2**

Other EPC Mitigation Not Related to Mining (2024-2025)

MUID	Wetland ID	Acres
LMU 22 CO	LMU 22 CO: Hydrologic Impact Area	12.7
Hurrah Creek SA-	Hurrah Creek (SA): Onsite - Middle segments (MS) 8, MS 10, MS 11, MS 12, Lewis Branch	73.6
	Total Released by EPCHC 2024-2025	**86.3**
	Grand Total Released by EPCHC	**1,840.5**

Reclamation Programs Released by FDEP to Date (Ending June 30, 2025)

MINE	LRUID	ACRES
	BP-L-1	2
	BP-L-2	2
	BP-L-4A	1
	BP-L-85(4)*	1
	BP-L-SP(2A)	371
	BP-L-SP(5)	6
BPL	BP-L-SP(8)	485
	IMC-FCL-AC(3A)	358
	IMC-FCL-AC(4A)	546
	IMC-FCL-AC(5)	246
	IMC-FCL-AC(6)	363
	IMC-FCL-AC(7A)	95
	IMC-FCL-HUC(4)	144
	IMC-FCL-LMR(3A)	366
	IMC-FCL-LMR(4)	800
	IMC-FCL-LMR(7)	701
	IMC-FCL-PC(1A)	487
	IMC-FCL-PC(3)	756
	IMC-FCL-SPAR(1)	145
	IMC-L-LMR(1B)	19
	IMC-FCL-LMR(11)	105
	IMC-FCL-LMR(14)	150
	ND	20
FCL	IMC-FCL-LMR(6)	900
	IMC-K-10	67
	IMC-KC-BOG(1)	890
	IMC-KC-BOG(2)	540
	IMC-KC-BOG(4)	317
	IMC-KC-BOG(5)*	763
	IMC-KC-HB(1)*	429
	IMC-KC-LB(6)	410
	IMC-KC-MC(1A)	864
	IMC-KC-MC(4)	562
	IMC-KC-MC(6)	242
	IMC-KC-MC(7)	243
	IMC-KC-OB(1)	176
	IMC-KC-SP(1)	129
	IMC-KC-SPA(12)*	578
KFD	IMC-KC-SPA(13)	287

Reclamation Programs Released by FDEP to Date (Ending June 30, 2025), Continued

MINE	LRUID	ACRES
	IMC-KC-TMC(1)*	238
	IMC-KC-WB(1)	256
	IMC-K-MC(2A)	533
KFD, cont.	IMC-K-MC(3)*	88
	Grand Total	**14,681**

SUMMARY OF 2025/2026 PROJECTED MINE OPERATIONS

The total acreage projected to be mined in Hillsborough County during 2025/2026 is approximately 0.0 acres.

Clay storage activities at FCO projected to continue at F-4, F-5, F-2D, F-7, and L-1, L-2, and L-3 ponds.

Reclamation Activities Planned for 2025/2026

The following reclamation is projected to be completed in the 2025/2026 report year:

Contouring

LRUID	ACRES
IMC-FCL-LMR(15)	439.0
IMC-FCL-PB(6)	100.0
IMC-FCL-PB(7)	89.0
IMC-FCL-HUC(1)	74.0
IMC-HPB(12)	10.6
IMC-FCL-LMR(9)	13.8
IMC-FCL-HPB(5)	55.0
Total	**781.4**

Wetland Planting

LRUID	ACRES
IMC-FCL-HUC(1)	103.0
IMC-FCL-PB(6)	23.0
IMC-FCL-PB(7)	29.3
Total	**155.3**

Upland Planting

LRUID	ACRES
IMC-FCL-HUC(1A)	23.0
IMC-FCL-LMR(15)	365.0
IMC-FCL-PB(6)	81.0
IMC-FCL-PB(7)	261.0
Total	**730.0**

Lake Development

None

2024-2025 ANNUAL CLAY REPORTING (RESOLUTIONS R18-129/R23-095)

The 2024-2025 data for annual clay reporting as required by Resolution R23-095 (5-year renewal was issued on November 8, 2023, with the original approval R18-129 approved on November 14, 2018) was submitted to Hillsborough County on November 18, 2024. The submittal which includes the 2024 CSA Inspection Report and a table that reflects the clay deposited in Hillsborough County from November 1, 2023, through that reporting period (October 31, 2024) is located in Appendix 1.

MINING UNIT RECLAMATION TIMING SCHEDULE

Ongoing discussions with Hillsborough County regarding reclamation timing in various mining units have identified reclamation schedules that will be updated via administrative application as outlined in Section 8.02.04, HCLDC, and Section 6.4.1.J., Hillsborough County Development Review Procedures Manual. Timing adjustments are due to revisions and/or extensions with mine sequencing and clay settling area construction which has affected the timing of sand tailing backfill plans. In addition, several Executive Order time extensions have been approved for DRI 263 and county resolutions allowing for extended use of clay settling areas also affect timing of reclamation. A table listing the currently approved reclamation schedules with the estimated revised dates is located in Appendix 2.

Appendix 1

Mosaic Fertilizer, L.L.C.
13830 Circa Crossing Drive
Lithia, Florida 33547
Tel 813.500.6300
www.mosaicco.com

Via Electronic Delivery

November 18, 2024

Mr. Jeffry Greenwell
Section Manager
Public Utilities Department
332 N. Falkenburg Road
Tampa, Florida 33619

RE: Hillsborough County DRI 263 Clay Summary Report
Resolution R23-095, Section 2. Conditions B-E
Four Corners / Lonesome Mines

Dear Mr. Greenwell:

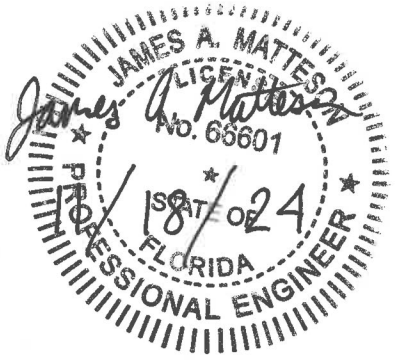
In accordance with the requirements of Hillsborough County Resolution R23-095, Section 2. Conditions B – E for the Four Corners / Lonesome Mine in southeast Hillsborough County, please find attached a Clay Summary Report for the reporting period of 11/1/2023 through 10/31/2024. Based on my review of production data for the year and the latest available survey data for the applicable clay settling areas, the attached report summarizes the clay storage in Hillsborough County as of October 31, 2024.

If you have any additional questions or require additional information, please feel free to contact me at (813) 267-6343.

Sincerely,

James A. Matteson

James A. Matteson, P.E.
Florida Registration 66601
Geotechnical Engineer Lead



Cc: Tony Alhomsi – Hillsborough County
Ed Coppock – Hillsborough County
Mike Carter – Hillsborough County
Sam Elrabi – Hillsborough County
Adam Gormly – Hillsborough County
Kevin Moran – Hillsborough County
Kim Cruz – Hillsborough County
Nancy Takemori – Hillsborough County
Mike Thompson – Hillsborough County
Shelley Thorton – Mosaic
Jake Dotson – Mosaic
Laura Morris – Mosaic
Lorelei Duke – Mosaic

Hillsborough County Clay Summary for Reporting Period of 11/01/2023 - 10/31/2024

1) The total volume of clay processed in Hillsborough County;	32,361	tons
2) The volume of clay deposited in the Hillsborough County CSAs;	see below	
3) The remaining available volume for clay disposal in the Hillsborough County CSAs;	see below	
4) The volume of clays mined from Hillsborough County and deposited in the Hillsborough County CSAs;	32,361	tons
5) The volume of clays mined from Hardee County and deposited in the Hillsborough County CSAs;	1,739,050	tons
6) The volume of clays mined from Hardee County and returned to Hardee County;	4,366,726	tons
7) Provide any correspondence and/or data related to compliance with FDEP's PMFP and relating to any modification or change related to the CSAs;	N/A	

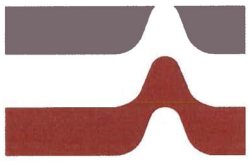
	Question 2	Question 3	
CSA	Clay Tons Deposited 11/1/23 to 10/31/24	Remaining Available Volume (as of 10/31/2024)	
		Acre - Feet	Tons (Assumes 11/15/28 Disposal End Date*)
L-1	0	3,458	1,160,825
L-2	0	3,838	1,288,280
L-3	0	3,922	1,316,525
F-2D	1,551,586	6,688	2,245,040
F-4	0	8,313	2,790,533
F-5	8,771	5,542	1,860,578
F-7	211,053	7,535	2,529,487
Totals	1,771,411	39,295	13,191,269

* Per Condition Section 2.A. of R23-095, regardless of whether each CSA is utilized to its full design storage capacity, this authorization to deposit clays from Hardee County in Hillsoborough County shall expire on November 15, 2028

MOSAIC FERTILIZER, LLC

Annual Inspection
Phosphatic Clay Settling Area Dams
Four Corners/Lonesome Sites
Hillsborough County, Florida

File Number: 24-0315



Ardaman & Associates, Inc.

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Ardaman & Associates, Inc.

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Materials Consultants

January 13, 2025
File Number: 24-0315

Mosaic Fertilizer, LLC
13830 Circa Crossing Drive
Lithia, FL 33547

Attention: Mr. Keith Beriswill. P.E. | Sr. Manager Engineering – Civil/Geotechnical

Subject: Annual Inspection of Phosphatic Clay Settling Areas Dams
Four Corners/Lonesome Sites
Mosaic Fertilizer, LLC, Hillsborough County, Florida

Ladies and Gentlemen:

As requested by Mosaic Fertilizer, LLC and authorized by Statement of Work No. MOSGTQ00000044 dated June 29, 2024, Ardaman & Associates, Inc. (Ardaman) performed the third-party annual inspection of earthen dams located within the Four Corners/Lonesome sites in Hillsborough County, Florida. The visual external inspections performed by Mr. Thomas J. Leto, P.E. of Ardaman were consistent with the requirements of Chapter 62-672, F.A.C. The following report presents a summary of visual observations and recommendations.

Based on the findings of this annual inspection and available information, it is our opinion that the earthen dams around the clay settling areas operated by Mosaic at these facilities, were generally maintained and safely operated within industry standards for their intended use. While the following report provides recommendations concerning normal maintenance, we did not observe any conditions that required immediate corrective maintenance.

The conclusions and recommendations presented herein are based on a visual external inspection of the subject facilities and apply only to existing conditions and operating procedures that were known to us at the time of inspection. The inspection was conducted, the conclusions reached, and recommendations made were in accordance with generally-accepted engineering principles and practice.

If there are any questions regarding the contents of this inspection report, please contact the undersigned at (863) 533-0858.

Sincerely,
ARDAMAN & ASSOCIATES, INC.
Florida Certificate of Authorization No. 5950

THOMAS J. LETO No. 12458 STATE OF FLORIDA PROFESSIONAL ENGINEER

Thomas J. Leto, P.E.
Senior Consultant
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SECTION 1.0

INTRODUCTION

This section provides a brief overview of the Mosaic Fertilizer, LLC (Mosaic) clay settling area dams associated with the Four Corners/Lonesome sites in Hillsborough County, Florida. A more detailed description of the sites and facilities is provided in Attachment 1. An overview site plan showing site facilities overlain on the December 2023 aerial photograph provided by Mosaic is presented on Figure 1.

1.1 Site Location and Facilities

The Four Corners facilities are located west of State Road 37 in southern Hillsborough County. The Lonesome facilities are located in Hillsborough County, east of County Road 39 and north of County Road 674. All Mosaic settling area dams that were in operation or retired in Hillsborough County are covered within the scope of this inspection report.

1.2 Background

The Four Corners mine and beneficiation facilities were developed by W.R. Grace & Company during the early 1980s. IMC acquired the Four Corners operation during the mid-1990s, and later built the Lonesome Central Screening facilities. Mosaic Fertilizer, LLC acquired ownership of Four Corners and Lonesome during 2004. The facilities description is presented in Attachment 1. The site overview and vicinity plan is presented on Figure 1. The inspected facilities included: Clay Settling Areas F-2A, F-2B, F-2C, F-2D, F-4, F-5, and F-7 in Hillsborough County. The inspected facilities also included: the Lonesome Clay Settling Areas L-1, L-2, and L-3 east of County Road 39 in Hillsborough County.

SECTION 2.0

INSPECTION RESULTS

This section provides a brief description of the inspected facility components and summary of inspection observations and any recommendations.

2.1 Method of Inspection

The third-party annual inspection was undertaken on the following dates:

Four Corners Mine		
Location	**Date**	**Mosaic Escort**
F-2A F-2B F-2C F-2D	July 11, 2024	John Spears
F-7	July 25, 2024	John Spears
F-4 F-5	August 20, 2024	Jamal McGill
Lonesome Mine		
Location	**Date**	**Mosaic Escort**
L-1 L-2 L-3	August 20, 2024	Jamal McGill

Our inspection was performed from a slow-moving vehicle while traversing the crest and toe roads. Closer observations were made on foot where applicable in areas not accessible to the vehicle. Our visual inspection of each dam focused on the conditions in the ponded areas, on the dam crest, the exterior and interior slopes, exterior toe areas, and ground conditions within 50 feet of the outside toe. We observed pond levels, drainage patterns within each pond, water level control structures, discharge pipes end conditions above water level, and return water and/or storm runoff ditches. It is noted that adequate mowing of vegetation of critical areas was performed prior to our inspection.

A review of pertinent information, available aerial photograph of the site and vicinity, weekly in-house inspection reports, and piezometer data was performed. Photographs taken during the inspection are kept in our files.

2.2 Settling Area F-2A

Area F-2A, initiated in 1995, and its dam modified in 2001, had been used almost continuously for phosphatic material disposal until its retirement. After reclamation the western edge of the area was fitted with an above-grade flow-through channel to provide a means of transferring clay material to a pump station located at its northwest corner. One pressured pipeline discharges material into an adjacent area that is separately channelized.

The far eastern side of the area abuts the hydraulic return and drainage ditch serving Area F-2D. The north side of Area F-2A abuts the south wall of retired Area F-2B. The west elevated channel continues to receive clay material slurry from a series of pressured pipelines located east of the southwest corner of the channel. Material is disposed in an area located east of the main fluid channel. The ends of the former series of nine (9) discharge pipes have been isolated with a cofferdam.

2.2.1 Inspection Comments

The following presents our observations and recommendations concerning the Clay Settling Area F-2A dam. Refer to Figure 1 for the overview site plan and Figure 2 for the detailed site plan. In general, the west and south perimeter dams were observed to be well-maintained for their intended use. The north and east sides of 2A abut Area 3B to the north and Area 2D to the east.

- The crest of the F-2A west dam and its inspection road surface were observed to be in a satisfactory condition and well-maintained.

- A former plunge pool area at the former slurry discharge point remains isolated and dry. The new discharge pipes were observed to lie above the water line in the relocated plunge pool.

- The discharge channel was observed to be in a satisfactorily-maintained condition.

- The inside slopes of the F-2A west and south walls were generally observed in satisfactory condition with well-established vegetation. The north and east boundaries are the south dam of Area 3B and west wall of Area 2D respectively which are in satisfactory condition.

- The exterior slopes of the F-2A west and south walls were generally observed to be in satisfactory condition and well-vegetated. Storm water runoff from the dam outside slope surface is routed to the adjacent ditch via the toe road surface. No indicators of seepage outbreak or erosion on the dam surfaces were noted above the toe road.

- The south and west toe inspection roads were observed to be in accessible condition.

- The water level in the flow ditch was recorded on the date of inspection at approximately Elevation 168.8 feet (NGVD). The channel contained dilute clay slurry traversing across sandy sediment in the channel bottom. The flow ditch and its banks were observed to be in a stable condition.

- The high-level auxiliary spillways that are located through the west dam were observed to be in a satisfactory condition. The rim of risers is Elevation 169.0 feet (NGVD). The dilute fluid level in the channel was 0.2 feet below the weir. The high-level spillway outfall pipes were in a satisfactory condition.

- The north side of the F-2A area abuts the southern wall of the retired F-2B area which crest surface is higher than the F-2A liquid level.

2.2.2 Operating Levels

Four new slurry input pipes on the south wall were active. The water level in the transfer ditch fluctuates with clay input and pump out-take as dictated by plant needs. The maximum design liquid level is 170 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.2.3 Summary of Observations and Recommendations

The dam enclosing the west and south sides of Area F-2A was generally observed to be in a satisfactory condition. Embedded pipelines in the former plunge pool no longer posed a risk of internal dam fill erosion.

2.3 Settling Area F-2B

Area F-2B, built to a crest level of 190 feet (NGVD) in a mine pit was used almost continuously for phosphatic clay disposal until its retirement. The south and east walls abut Areas F-2A and F-2C, respectively. Interior clearing and mowing operations are ongoing within the southeast section.

2.3.1 Inspection Comments

The following presents our observations and any recommendations concerning the retired Clay Settling Area F-2B dam. Refer to Figure 1 for the overview site plan and Figure 2 for the detailed site plan. The perimeter dam was generally observed to be well-maintained for its intended use.

- The crest of the dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff into the settling area.

- The inside slopes of the F-2B dam were generally observed to be in a satisfactory condition. Existing vegetative cover is well- established on the slopes and observed to be in a satisfactory condition.

- The exterior slopes of the north, south, and west walls were generally observed to be in a satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the adjacent drainage ditch.

- The west and north toe inspection roads were observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential. A toe road is not present along the pipeline routes located at the base of the outside slope of the south wall. The pipeline berm was observed to be stable.

- The east wall of Area 2B; shared with the west side of Area 2C, was observed to be in a satisfactory condition. No free water was observed on either side of the common wall.

- The Area 2B pond contains no discernable bodies of clear water over the clay deposit within the settling area with exception of an historical dredge pool that holds clear water near the southwest corner of the area. No water stands directly against the inside edge of the perimeter dam of Area 2B.

- Two spillways were open, one at the northwest and one at the northeast corners respectively, and available to discharge rain runoff. The spillways were accessible for inspection. The steel structures are highly corroded, but in a useful and safe condition for storm water runoff control.

- The north return hydraulic ditch and its banks were observed to be in a satisfactory condition.

2.3.2 Operating Levels

Existing spillways are open to allow discharge of storm water runoff. The maximum design pond water level is 185 feet (NGVD). The minimum freeboard of 5 feet was met during the time of the inspection.

2.3.3 Summary of Observations and Recommendations

The dam enclosing Area F-2B was generally observed to be in a satisfactory condition. No maintenance requirements were noted.

2.4 Settling Area F-2C

Area F-2C was used for phosphatic clay disposal until the latter part of 2019.

Background Information

Mosaic inspectors detected two ground subsidence events on the outside slope of the east dam of the CSA F-2C in October 2019. Two subsidence features comprised of straight-sided circular shafts were in above and in approximate alignment with the underlying south spillway outfall culvert. The circular feature closest to the outside dam crest was 16 feet downslope from the outside crest edge, 7 feet across, 16 feet deep, and with near vertical sides. The second feature was 51 feet downslope of the outside crest edge, 9 feet across, less than 16 feet deep, and with near vertical sides. The bottom of the shafts presented a surface of a weathered soil column but did not contain any standing water. The cause was believed to be internal erosion of soils below

the phreatic surface through a defect in a non-pressured pipe culvert. The subsidence was in response to the loss of material above the pipe. Representatives of the Florida Department of Environmental Protection, Phosphate Management, Mosaic, and Ardaman & Associates, Inc. inspected the site on October 4, 2019. Department personnel were advised by Ardaman that there was no danger of a dam collapse or potential of release of liquid since the CSA did not contain any standing water in this locale. A limited camera inspection subsequently was performed; no separation or holes were seen in the pipe walls nor was there any water flowing into the pipe from an external source. Although the events were judged to have been caused by internal erosion of soil into the pipe, Ardaman concluded that the spillway pipe was stable and immediate repairs were not warranted as long as the spillway was taken out of service and water was not discharged into the pipe, and the settling area taken out of service. The spillway tower weir boards were set to prevent flow of water into the intake tower over the weir boards. Monitoring only was recommended. Mosaic has not discharged any water into this area since the features were found. The area has been substantially drained of surface water. The interior area is undergoing ditching and enhanced surface drainage.

2.4.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area F-2C dam. Refer to Figure 1 for the overview site plan and Figure 2 for the detailed site plan. The perimeter dam was generally observed to be well-maintained for its intended use. The spillways are nearly 29 years of age. The intake structures were observed to be in poor structural condition, and at the end of their useful life.

- The crest of the perimeter dam and its inspection road surfaces were observed to be in a satisfactory condition. The perimeter dam crest surface was designed to slope gently toward the pond side which provides satisfactory drainage of rainfall runoff.

- The interior slopes of the F-2C perimeter dam were generally observed to be in a satisfactory condition. Existing vegetative cover was well-established on the slopes and observed to be in good condition and well-maintained.

- The exterior slopes of the F-2C dam were generally observed to be in satisfactory condition, well-vegetated, and well-maintained. Storm water runoff from the dam surface is routed to the adjacent ditch. The two erosion features existing in the outside slope in line with the southeast spillway were observed to be stable. No changes in surface diameter were discerned. Their depths were observed, and the bottom of the shaft shows no sign of activity.

- The toe inspection road was observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- The clay level at the northeast spillway was below board reading but was estimated on the date of inspection to be below Elevation 176 feet (NGVD). The pond did not contain

any clear water over the clay deposit within the northeast part of the settling area. The clay level in vicinity of the southeast spillway was observed to stand below Elevation 179 feet (NGVD). No standing water was present in this sector.

- The spillways at both the northeast and southeast corners were observed to be in poor structural condition. Steel members observed above the settled clay were heavily corroded. The spillway at the northeast corner is open to discharge any rainfall runoff. The southwest spillway is to be kept closed to avoid discharge of water.

- The north hydraulic ditch and its banks were observed to be in a satisfactory condition. The water level was observed at Elevation 135.8 feet (NGVD). The spillway pipe ends were submerged. The east hydraulic ditch and its banks were observed to be in a satisfactory condition. The exposed (outlet) ends of the steel discharge pipe was observed to be in a satisfactory condition. No indicators of seepage outbreak were noted below or around the pipe outlet areas. Stone rip-rap cover on the banks around the pipes was observed to be stable.

2.4.2 Operating Levels

The water levels at the northeast spillways may fluctuate with seasonal rainfall. The maximum design pond water level is 185 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.4.3 Summary of Observations and Recommendations

- The perimeter dam enclosing Area F-2C was generally observed to be in a satisfactory condition. The spillway intake structures are in very poor condition and should be monitored for weir board and internal frame deformation.

- Stormwater runoff should continue to be diverted away from the southeast spillway.

- Continued monitoring of the two subsidence features is recommended.

2.5 Settling Area F-2D

Area F-2D has been used almost continuously for phosphatic clay disposal and as a clay slurry thickener. The area was receiving clay slurry during the time of inspection. A dredge was located in the area and is used for extraction and transfer of thickened slurry to outlying active settling areas. Two high-level spillways are present in the southern end of the west wall. Three original service spillways were previously sealed and abandoned. Four auxiliary spillways are located near the southern end of the west wall. The south hydraulic ditch was previously filled in with sand tailings to form a level platform that is part of a service corridor. The west hydraulic ditch system was modified with the addition of two high-level spillways that discharge clarified water into the adjacent hydraulic return ditch. The operating section of the hydraulic ditch, (called Northwest Return Channel), has a maximum design water level of 176.0 feet (NGVD) with a design freeboard of 5 feet. The north side of the impoundment abuts the south wall of Area F-2C.

2.5.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area F-2D dam and its Northwest Return Channel. Refer to Figure 1 for the overview site plan and Figure 2 for the detailed site plan. The perimeter dam was generally observed to be maintained for its intended use.

- The crest of the perimeter dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface runoff drainage is controlled with rain runoff outlet pipes.

- The east and south interior slopes of the F-2D dam were generally observed to be in a satisfactory condition. Existing vegetative cover is well-established on the slopes and observed to be in a satisfactory condition and well-maintained on the north, east and south walls. Vegetation on the west dam inside slope, north of the spillways, is generally high and requires reduction.

- The exterior slopes were generally observed to be in a satisfactory condition and well-vegetated on the south and east walls, and west wall north of the spillways. The exterior slope north of the spillways is heavily vegetated and requires reduction.

- The west wall north of the spillways was observed to contain numerous abandoned steel pipes penetrating through the freeboard section of the dam. The piping network is leftover from a prior period when a mechanical/chemical method was used to thicken the dilute clay slurry. Vegetation coverage is very heavy around the pipes. This heavy vegetation requires reduction.

- It is noted that one clay of the slurry steel pipeline passes through the freeboard near the north end of the west dam. Four input clay lines were noted (next to a former control house).

- The sand sediment deposit along the northern end of the west wall has risen significantly at and around the clay slurry discharge points. The sediment should be ditched to lower the fluid level against the west wall in proximity of the former control house.

- Storm water runoff from the dam surface is appropriately routed to the toe swale. Water in the toe swale is routed to an outside receiving area through pipe culverts or land spreading.

- The toe road along the west wall is adequate for inspection access. Vegetation cover along the toe road is maintained. A number of segments of abandoned piping and equipment were observed along the toe road route. Heavy vegetation is present along the piping route and above the toe of dam and requires reduction.

- The toe inspection road over the south and east dam berm was observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential. There were no indications of seepage outbreak on the dam slope above the toe level.

- The pond water level in Area 2D was recorded on the date of inspection at approximately Elevation 183.75 feet (NGVD). The pond contains a variable depth of clear water over the clay deposit.

- The intake structures of the two high-level service spillways were observed to be in good condition and well-maintained. The ends of the pipes were in good shape and the erosion protection mat stable. The rim of internal risers stands at Elevation 181.6 feet (NGVD).

- The intake structures of the four auxiliary spillways were observed in a deteriorated condition with corrosion of metal. Some internal steel bracing and side wall corrosion was noted. Corrosion breakthrough was observed in the side walls above the water line. The outlet end areas of the CMP discharge pipes were in satisfactory condition with appropriate erosion protection. The outfall pipes were inspected with a CCTV camera and no adverse conditions noted.

- The Northwest Return Hydraulic Ditch and its banks were observed to be in a satisfactory condition. The exposed (outlet) ends of the steel discharge pipes from the high-level spillways were observed to be in a satisfactory condition for intended use. The elevated return ditch water level was observed at Elevation 174.6 feet (NGVD). No indicators of seepage were noted below or around the pipe outlet areas. Fabric-formed concrete cover on the banks around the pipes was observed to be performing well. The adjacent stone rip-rap was observed in good condition.

- The high-level outlet works of the hydraulic ditch including two sets of twin stilling tanks were observed to be in good working order. Water was being discharged into the below-grade ditch that returns water to the plant via a pump system. The ditch water was at normal operating level.

- Erosion of the toe road shoulder, and lower outside slope, previously observed east of the spillway discharge pipes, had been repaired. This area should be monitored.

- The dam containing the above-grade portion of the hydraulic ditch was observed to be in a satisfactory condition.

- A boom laid across the northwest return hydraulic ditch keeps floating wood and vegetation from entering the entrance channel.

2.5.2 Operating Levels

The water level in F-2D fluctuates with input/outtake water balance as dictated by plant needs. The maximum design pond water level is185 feet (NGVD). The minimum freeboard in F-2D and the return ditch was met during the time of the inspection.

2.5.3 Summary of Observations and Recommendations

The dam enclosing Area F-2D was generally observed to be in a satisfactory condition. The following maintenance requirements were noted:

- Reduction of vegetation height along the abandoned pipelines and old equipment adjacent to the west toe road area of the F-2D wall.
- Monitoring of the upper slope surfaces where abandoned and/or active steel pipes pass through the freeboard section of the west wall. The fluid level shall be maintained below the invert of any pipeline that penetrates the freeboard of the dam.
- Ditch or dredge the sediment build-up at the northwest corner of the pond area to avoid excess fluid build-up at the pipeline discharge areas.
- The intake structures of the high-level auxiliary spillways should be monitored for advancement of steel corrosion of structural members that actuate the gates and corrosion in the side walls of the intake barrels.

2.6 Settling Area F-4

Area F-4 had been used almost continuously for phosphatic clay disposal. The area was not receiving clay slurry during the time of inspection. The north wall of F-4 is common with the Area F-5 pond to its north. Liquid (mostly stormwater runoff) is discharged into Area F-5 to its north through the F-4 Transfer, which is a high-level spillway system. Rain runoff for Area F-4 was being actively discharged into Area F-5. A pool of water of unknown depth over clay was observed within the northwest corner area of Area F-4.

2.6.1 Inspection Comments

The following presents our observations and any recommendations regarding the Clay Settling Area F-4 dam. Refer to Figure 1 for the overview site plan and Figure 3 for the detailed site plan. The perimeter dam of F-4 was generally observed to be well-maintained for its intended use.

- The crest of the dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff through the inside crest edge drain.

- The interior slopes of the F-4 dam were generally observed to be in a satisfactory condition. Existing vegetative cover that is well-established on the inside slopes was observed to be in good condition and well-maintained.

- The outside slopes of the exterior walls were generally observed to be in a satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the toe swale. Water in the toe swale is routed to a receiving area through pipe culverts on the south and east sides and sheet flow into the east hydraulic ditch.

- The north slope (outside slope of the F-4 north wall) of the common wall shared with F-5 to the north was observed to be stable and satisfactory. Brush and small trees that existed on the lower section of the slope have been cut. Storm water runoff sheet flows into Area F-5.

- Tall vegetation on the lower outside slope near the northeast corner of the pond was sprayed with herbicide.

- The exterior dam toe inspection roads were observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- The intake structure of the high-level transfer spillway in the F-4 pond was observed to be in a satisfactory condition. The spillway gate was opened to discharge water into Area F-4. The downstream flow transfer/stilling tower was likewise observed to be in a satisfactory condition, as well as its multiple discharge pipes leading into the Area F-5 pond. The pond level at the F-4 Transfer was Elevation 166 feet (NGVD).

- Two spillways are located side by side through the east dam near the northeast corner of the pond. Very shallow water over clay was observed in vicinity of the twin spillways. The pond surface was estimated at Elevation 166 feet (NGVD). The intake towers were observed to be in a poor to satisfactory condition. They are adequate to discharge any buildup of rain runoff.

- A single spillway (SE) is located through the east dam near the mid-point of the wall. The intake structure was observed to be in a poor to satisfactory condition. The sediment surface in proximity of the tower was estimated at Elevation 166 feet (NGVD). A very shallow water pool was observed around the spillway tower. This spillway is adequate to discharge any buildup of rain run off.

- The east return hydraulic ditch was observed to be in a satisfactory condition. The exposed (outlet) ends of the steel discharge pipes for the three service spillways were observed to be in a satisfactory condition for intended use. No indicators of seepage were noted below or around the pipe outlet areas. Rubble rip-rap cover on the banks around the pipes was observed to be stable.

- The elevated hydraulic ditch on the east side of F-4 and F-5 is retained by an earthen dam. The crest of the dam and inside slopes were observed to be in a satisfactory condition. The outside slopes are kept mowed a distance of about 10 to 15 feet below crest level. The slopes were observed to be stable.

2.6.2 Operating Levels

The water level fluctuates with input/outtake water balance as dictated by storm runoff. Rain runoff was being discharged from Area F-4 into F-5 through the F-4 Transfer. The other three spillways were discharging board leakage water into the return hydraulic ditch. The maximum design pond water level in Area F-4 is 170 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.6.3 Summary of Observations and Recommendations

The dam enclosing Area F-4 was generally observed to be in a satisfactory condition.

No maintenance requirements were indicated.

2.7 Settling Area F-5

Area F-5 has been used almost continuously for phosphatic clay disposal. The area was receiving clay slurry from a plant line placed at the southwest corner.

2.7.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area F-5 dam. Refer to Figure 1 for the overview site plan and Figure 3 for the detailed site plan. The perimeter dam was generally observed to be well-maintained for its intended use.

- The crest of the dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff through the inside crest edge drain.

- The interior slopes of the F-5 dam were observed to be in a satisfactory condition. Existing vegetative cover that is well-established on the slopes was observed to be in good condition and well-maintained.

- The exterior slopes were generally observed to be in satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the toe swale. Water in the toe swale is routed to an outside receiving area through a pipe culvert.

- Low-level slope seepage (banded) detected on the northeast section of the dam was successfully repaired in 2022.

- The toe inspection road was observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- This area is served by two spillways which discharge into the return hydraulic ditch system. The intake structures were observed to be in a satisfactory condition. The flash boards were deteriorated. The pond water level was recorded on the date of inspection at approximately Elevation 138.8 feet (NGVD). The pond contains a variable depth of clear water over the clay deposit.

- The return hydraulic ditch, its banks, and containment dam were observed to be in a satisfactory condition. The exposed (outlet) ends of the steel discharge pipes were observed to be in a satisfactory condition. No indicators of seepage were noted below or around the pipe outlet areas. Grout-filled fabric cover on the banks around the pipes was observed to be stable.

2.7.2 Operating Levels

The water level fluctuates with input/outtake water balance as directed by plant needs. The maximum design pond water level is 145 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.7.3 Summary of Observations and Recommendations

The dam enclosing Area F-5 was generally observed to be in a satisfactory condition.

No maintenance requirements were indicated.

2.8 Settling Area F-7

Area F-7 has been used almost continuously for phosphatic clay disposal. The area was receiving clay slurry during the time of inspection.

2.8.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area F-7 dam. Refer to Figure 1 for the overview site plan and Figure 3 for the detailed site plan. The perimeter dam was generally observed to be well-maintained.

- The crest of the dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff through the inside crest edge drain.

- The interior slopes of the F-7 dam were generally observed to be in a satisfactory condition. Existing vegetative cover that is well-established on the slopes was observed to be in good condition and well-maintained. The maintenance work on the inside slope has held up well.

- The exterior slopes were generally observed to be in satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the adjacent ditch.

- The toe inspection road was generally observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- General seepage is present on the toe road of the south wall, beginning 450 feet east of the south spillway and running a distance of 155 feet eastward. No indication of instability of the lower outside slope of the dam, or toe road slope was observed. The seepage zone on the toe road is typically controlled with a fine gravel to maintain a stable roadway. Collected seepage water as well as rain runoff sheet flow across the toe road is discharged into the return hydraulic ditch through drain outlets. A maintenance layer of fine gravel is recommended.

- Area F-7 is served by three spillway which discharge into the east and south branches of the return hydraulic ditch. The pond water level was recorded on the date of inspection at approximately Elevation 142.8 feet (NGVD). The pond generally contains a variable depth of clear water over the clay deposit on the eastern side of the diverter wall.

- The return hydraulic ditch and its banks were observed to be in a satisfactory condition. The exposed (outlet) ends of the spillway discharge pipes were observed to be in a satisfactory condition. No indicators of seepage were noted below or around the pipe outlet areas. Fabric-formed concrete cover on the banks around the pipes was observed to be stable.

- Minor inside slope erosion were noted along parts of the backslope of the south and east branches of the ditch, and along the eastbound extension of ditch which drains to a conduit system below County Road 39. This condition is not considered critical and no maintenance is required at this time.

2.8.2 Operating Levels

The water level fluctuates with input/outtake water balance as directed by plant needs. The maximum design pond water level is 149.0 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.8.3 Summary of Observations and Recommendations

The dam enclosing Area F-7 was generally observed to be in a satisfactory condition.
The following recommendations are made:

- Add a maintenance layer of washed pebble on the toe road at the specified seepage zone.

- The upper parts of the return hydraulic ditch banks have experienced minor sloughing. The cause of soil material loss on the upper inside slopes is related to overbuild of the crest width to form the delineation berms. Monitoring only is recommended at this time.

2.9 Settling Area L-1

Area L-1 was not used for phosphatic clay disposal during 2024. Area L-1 shares a common (east wall) dam with Area L-2 to its east. There exists a number of steel pipelines laying on the south and west toe areas of the dam. The pipelines were observed to be idle during the time of inspection.

2.9.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area L-1 dam. Refer to Figure 1 for the overview site plan and Figure 4 for the detailed site plan. The perimeter dam was generally observed to be well-maintained for its intended use.

- The crest of the dam and its roadway surfaces were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff through the inside crest edge drain.

- The interior slopes of the L-1 dam were generally observed to be in a satisfactory condition. Existing vegetative cover that is well- established on the slopes was observed to be in good condition and well-maintained.

- The exterior slopes were generally observed to be in satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the toe swale. Water in the toe swale is routed to an outside receiving area through pipe culverts.

- The outside slope of the east wall abutting the L-2 pond exhibits an approximately 100- foot long feature that appeared as a minor slough. The slough is located at approximate mid-height of the east dam, between the dam toe at Elevation 110 feet (NGVD) and the crest edge at Elevation 160 feet (NGVD).

- An approximately 540-foot stretch of the south wall of L-1 exhibits a narrow band of very slight high-level seepage. The damp zone begins east of the sub-station. Very slight seepage conditions were observed during a walk-over. The damp surface was firm and noted to be unmarked nor rutted by mower tracks. This area should continue to be monitored.

- The toe inspection roads along the north wall and north end of the west wall were observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- An HDPE clay slurry line was laid on the outside shoulder of the north toe road. Where present, the outside slope of the toe road and hydraulic ditch can be observed by crossing the pipe on a stair-bridge.

- The pond water level was recorded on the date of inspection at approximately Elevation 154.6 feet (NGVD). The pond contains a variable depth of clear water over the clay deposit.

- The north return hydraulic ditch banks were observed to be in good condition. The ends of the steel discharge pipes were below water. The tail water elevation was recorded at Elevation 116.5 feet (NGVD).

2.9.2 Operating Levels

The water level fluctuates with rainfall runoff and spillway out-take. The maximum design pond water level is 155 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.9.3 Summary of Observations and Recommendations

The dam enclosing Area L-1 was generally observed to be in a satisfactory condition.

The following is recommended:

- Monitor the minor slough located on the outside slope of the east wall.

- Continue to monitor the high-level seepage band on the south wall.

2.10 Settling Area L-2

The area was not receiving clay slurry during the time of inspection.

2.10.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area L-2 dam. Refer to Figure 1 for the overview site plan and Figure 4 for the detailed site plan. The perimeter dam was generally observed to be well-maintained for its intended use.

- The crest of the dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff through the inside crest edge drain.

- The interior slopes of the L-2 dam were generally observed to be in a satisfactory condition. Existing vegetative cover that is well-established on the slopes was observed to be in good condition and well-maintained.

- The outside slopes of the exterior walls were generally observed to be in satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the toe swale. Water in the toe swale is routed to an outside receiving area through pipe culverts.

- The toe inspection roads of the exterior walls were observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- The common wall between Areas L-2 and L-3 was observed to be in a satisfactory condition.

- The intake of the two original service spillways were submerged in clay and inoperable for transfer of fluids to Area L-3. The high-level service spillway was not capable of transferring fluids to Area L-3 due to the higher head level in Area L-3. The two high-level spillways in the northwest corner of L-2 are capable of discharging water into the return hydraulic ditch system. The twin spillway intake towers and downstream works were observed to be in a satisfactory condition.

- The twin intake towers of the northwest spillways were observed in good condition. The pond level at the location was recorded at Elevation 137 feet (NGVD). The stilling tanks and downstream discharge area were in good condition.

2.10.2 Operating Levels

The water level fluctuates with rainfall runoff and spillway out-take. The pond level was observed at Elevation 137 feet (NGVD) west of the diverter wall. The maximum design pond water level is 140 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.10.3 Summary of Observations and Recommendations

The dam enclosing Area L-2 was generally observed to be in a satisfactory condition. No maintenance requirements were noted.

2.11 Settling Area L-3

The area has not received clay slurry during 2024.

2.11.1 Inspection Comments

The following presents our observations and any recommendations concerning the Clay Settling Area L-3 dam. Refer to Figure 1 for the overview site plan and Figure 4 for the detailed site plan. The perimeter dam was generally observed to be well-maintained for its intended use.

- The crest of the dam and its inspection road surface were observed to be in a satisfactory condition. The crest surface was designed to slope gently toward the pond side and provides satisfactory drainage of rainfall runoff through the inside crest edge drain.

- The interior slopes of the L-3 dam were overall satisfactory. Existing vegetative cover that is well-established on the slopes was observed to be in good condition and well-maintained.

- The exterior slopes were generally observed to be in satisfactory condition and well-vegetated. Storm water runoff from the dam surface is routed to the toe swale. Water in the toe swale is routed to an outside receiving area through pipe culverts.

- The toe inspection road was observed to be well-drained and graded appropriately so that runoff flows away from the dam toe in a way that minimizes erosion potential.

- Seepage was detected in the toe swale of the section of the north dam, western connection with the northeast corner of Area L-2. The vegetated swale rises up in the westerly direction to material the tow swale of the north wall of Area L-2. Seepage is general in nature and collected water is discharged through drain pipes. No indications of concentrated seepage or boils were observed during a walkover in the ditch. Maintenance recommendations are summarized in the following section.

- The pond water level was recorded on the date of inspection at approximately Elevation 134.5 feet (NGVD). The pond contained a variable depth of clear water over the clay deposit within the settling area.

- The return hydraulic ditch and its banks were observed to be in a satisfactory condition. The toe road slope around the ends of the steel discharge pipes were observed to be in a satisfactory condition. No indicators of seepage were noted. The grout-filled fabric cover on the banks around the pipes was observed to be stable. The tail water elevation was recorded at Elevation 116.2 feet (NGVD).

2.11.2 Operating Levels

- The water level fluctuates with input/outtake water balance as dictated by plant needs. The maximum design pond water level is 140 feet (NGVD). The minimum freeboard was met during the time of the inspection.

2.11.3 Summary of Observations and Recommendations

The dam enclosing Area L-3 was generally observed to be in a satisfactory condition.

Collection of seepage in the toe ditch and vegetation reduction in the ditch and on the lower slope are recommended. The wet area should be stripped of grass prior to applying a 12-inch deep layer of fine, washed pebble. The lower edge of the pebble material drain should terminate in the bottom of the toe swale.

2.12 Review of Inspection Reports

Mosaic performs periodic inspections of impoundment dams at the Four Corners/Lonesome sites. The weekly inspections are made by company employees qualified through Mosaic's Dam Program using licensed professional engineer trainers from Ardaman & Associates, Inc. A review of the inspection logs was performed by Ardaman in conjunction with the dam visual inspection. In general, the inspection file for calendar year 2023 was found to be complete. The inspection reports did not indicate any suspected critical conditions for the period of review.

2.13 Review of Aerial Photograph

The December 2023 aerial photograph supplied by Mosaic (shown on Figure 1) was reviewed for detection of site changes in conditions since our last annual review. No unusual conditions were detected on the aerial photograph. Photographs taken during the site inspection are stored in our files.

2.14 Performance Monitoring

Field performance is monitored and evaluated by the observational approach with assistance of record of total heads in the various piezometers that are read weekly. There were no indications of unusual or abnormal seepage flow patterns indicated in the piezometer records.



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APPROXIMATE SCALE: 1"=5000'

PHOTO DATE: DECEMBER 2023

OVERVIEW SITE & VICINITY AERIAL MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants
1525 Centennial Drive Bartow, Florida 33830
Tele. 863/533-0858 Fax 863/533-7325 CAN. 5950

ANNUAL INSPECTION

MOSAIC FERTILIZER, LLC.
FOUR CORNERS MINE
HILLSBOROUGH COUNTY, FLORIDA

DRAWN BY: RB	CHECKED BY: TJL	DATE: 5-29-2024
FILE NO. 24-0315	APPROVED BY: THOMAS J. LETO, P.E.	FIG. NO. 1

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APPROXIMATE SCALE: 1"=2000'

PHOTO DATE: DECEMBER 2023

SITE LOCATION PLAN ON AERIAL PHOTOGRAPH

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Geotechnical, Environmental and Materials Consultants
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Tele. 863/533-0858 Fax 863/533-7325 CAN. 5950

ANNUAL INSPECTION

MOSAIC FERTILIZER, LLC.
FOUR CORNERS MINE
HILLSBOROUGH COUNTY, FLORIDA

DRAWN BY: RB	CHECKED BY: JJL	DATE: 5-29-2024
FILE NO. 24-0315	APPROVED BY: THOMAS J. LETO, P.E.	FIG. NO. 2

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APPROXIMATE SCALE: 1"=2000'

PHOTO DATE: DECEMBER 2023

SITE LOCATION PLAN ON AERIAL PHOTOGRAPH

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FOUR CORNERS MINE
HILLSBOROUGH COUNTY, FLORIDA

DRAWN BY: RB	CHECKED BY: JJL	DATE: 5-29-2024
FILE NO. 24-0315	APPROVED BY: THOMAS J. LETO, P.E.	FIG. NO. 3

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APPROXIMATE SCALE: 1"=2000'

PHOTO DATE: DECEMBER 2023

SITE LOCATION PLAN ON AERIAL PHOTOGRAPH

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ANNUAL INSPECTION

MOSAIC FERTILIZER, LLC.
FCO / LONESOME MINE
HILLSBOROUGH COUNTY, FLORIDA

DRAWN BY: RB	CHECKED BY: JJL	DATE: 5-29-2024
FILE NO. 24-0315	APPROVED BY: THOMAS J. LETO, P.E.	FIG. NO. 4

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ATTACHMENT 1

Facilities Description

ATTACHMENT 1

Facilities Description

Settling Area F-2A

The F-2A settling area lies northeast of the Four Corners Beneficiation Plant in Hillsborough County, Florida. The south and west dams were external walls with design crest elevation of 170 feet (NGVD). The interior of F-2A was filled to its final design level with clay slurry from the Four Corners Mine over a long period. During the latter stages of disposal within the settling area, sand tailings was pumped along the inside of a portion of the west dam to create the base for an open channel used to distribute clay slurry to a stationary pump system located at the northwest corner of F-2A. The pump station was designed to lift clay slurry from F-2A to the adjoining F-2B, where the design maximum pond level was 185 feet (NGVD). The clay slurry level in proximity of the pump station was designed to have a maximum level of 165 feet (NGVD). In addition to clay slurry, a matrix slurry containing limestone boulders and gravel, silica sand, clay, and fine phosphate is discharged into the southwest corner of F-2A. During the active life of the area, sand tailings was also pumped within the southern one-half of F-2A.

The original crest elevation was 170.0 feet (NGVD) and the design crest width was 30 feet. The upper body of the west and south embankments consists of machine-hauled and compacted overburden soil fill placed atop a dozer-shaped and/or dozer-placed overburden spoil soil fill; all, in turn, lying on top of undisturbed bedclay and bedrock. The foundation of the outer section of the downstream slope is hydraulically-placed sand tailings. A ditch system runs adjacent to the west toe road.

During 2001, the crest of the west embankment of F-2A was raised by five feet to Elevation 175 feet (NGVD) in order to accommodate a higher fluid level within the north-south trending clay slurry delivery channel. The raising of the embankment crest was accomplished by placing compacted well-graded, gravelly clayey sand in shallow lifts to a new crest elevation of 175.0 feet and crest width of 30 feet. The clay introduction ditch water level was to be operated at or below Elevation 170 feet (NGVD) at all times. In addition to raising of the west wall crest, three over-flow spillways were installed to route extra water from the clay introduction ditch to the adjacent hydraulic ditch located adjacent to the toe of the west dam. Each spillway consists of a 9-foot diameter, coated, corrugated metal pipe attached to a 60-inch diameter, coated, corrugated metal pipe running through the embankment and on the surface of the outside slope. Each riser has a crest elevation of 168.5 feet and the outlet pipes have an invert elevation of 162.0 feet. The ends of the outlet pipes discharge into the hydraulic ditch at a pipe invert elevation of 130 feet (NGVD).

Settling Area F-2B

The F-2B settling area lies directly north of the F-2A settling area. The west and north dams are exterior walls with crest elevations of 190 feet (NGVD). The east dam is common with the adjacent F-2C settling area. The south side of the area abuts the F-2A dam. The upper body of the dam was built with a 30-foot wide crest with compacted overburden soil fill placed atop a dozer-shaped and/or dozer-placed overburden soil base.

Two square, steel-framed spillway towers were built inside of the north end of the west dam. One square, steel-framed spillway tower was built at the east end of the north wall. Two square, steel-framed spillways were constructed in the south-center of the east dam to discharge into the adjacent Settling Area F-2C. These two spillways are not used.

Settling Area F-2C

The F-2C settling area is located due east of F-2B and shares a common dam on its west side. Four spillways; a square, steel-framed tower at the south end of the east dam; two square, steel-framed towers at the east end of the north dam; and one through the west end of the south dam, which is inactive. The F-2C dam was constructed of hydraulically-placed sand tailings, found on leveled cast overburden soils in the pit. The outside slope was graded 4H. : 1V. A compacted overburden soil fill blanket was constructed on the upstream side at a slope ratio of 2.5H. : 1V. the dam crest was built to Elevation 190 feet (NGVD).

Settling Area F-2D

Settling Area F-2D is located north of the Hillsborough/Manatee County line within Section 36, Township 32 South, Range 22 East, Hillsborough County, Florida. The settling area dam is located north of the paved entrance road leading to the Four Corners Mine facilities and to the west of State Road 37. The F-2D embankment and hydraulic ditch system cover a footprint of about 708 acres and was constructed on mined land between April 1998 and May 1999. The settling area was constructed abutting the F-2A and the F-2C settling areas. The perimeter dam has a design crest elevation of 190 feet (NGVD), and a maximum design pond elevation of 185 feet (NGVD). The west dam of F-2D, a 4,500-foot long shared wall with F-2A, was raised from Elevation 170 feet (NGVD) to 190 feet (NGVD). The south and east dams of F-2D were constructed on previously-mined land along a length of about 9,800 feet. The north dam shares a wall with F-2C, which also has a crest elevation of 190 feet (NGVD). Sand tailings was used to build the bulk of the above-grade dam cross sections, and to fill existing mine cuts along the dam alignment. Stripped overburden soils borrowed from the interior of F-2D were used for compacted fill on the upstream face of the dam and structural fill in critical zones of the embankments, such as within the spillway pipe alignments.

For the south and east dams, a filter fabric-protected, perforated, corrugated HDPE drain was installed at a distance of 170 feet and 150 feet downstream of the southern and eastern embankment centerline, respectively, to provide internal seepage control. For the west dam, the internal drain was placed within the sand tailings at an elevation of 168 feet and offset approximately 45 feet downstream of the embankment centerline. The seepage collection drain consisted of 10-inch diameter slotted, and 10-inch diameter solid, corrugated, high-density polyethylene (HDPE) pipe that was wrapped in a geotextile filter. Outlet pipes from the drain were placed at 500-foot intervals to route seepage water beneath the toe roads and into the perimeter surface drainage and hydraulic return ditches.

Three spillway structures were located along the east side of the settling area. Each spillway consists of an 8-foot by 8-foot steel riser structure with wooden weir boards to control water levels within the settling area. At each spillway, a 60-inch diameter, 8-gauge, bituminous-coated,

galvanized steel, round, corrugated, metal outlet pipe is routed through the embankment and discharges into a return hydraulic ditch. The spillway located in the northeast corner of the settling area routes water into the return hydraulic ditch system which ran along Settling Area F-2C. The outlet pipe at this spillway had an invert elevation of 140.5 feet (NGVD). The spillways was sealed and abandoned. The two spillways located at the southeast corner of the settling area discharged in a return hydraulic ditch that routed return water along the south side of Settling Area F-2A. The invert elevation of the outlet pipes in both of these spillways was 134 feet (NGVD). Each of these spillways have been sealed, and the structures and outfall pipes abandoned.

Four high-level spillways were constructed in the vicinity of the southwest corner of F-2D in order to transfer clarified water from F-2D to a new north south trending elevated water return ditch built along the downstream toe of the west wall of F-2D. The spillways in this system were designed by Mosaic to transfer approximately 290,000 gallons per minute (gpm) of clarified water to a pumping station, which is located at the north end of the new elevated ditch. The clarified water is lifted from the elevated ditch and pumped back into area F2-D at the vicinity of clay introduction nozzles. In addition, a series of suction pumps and pipes were installed along the west wall of F-2D to withdraw thickened clays into a manifold system. The thickened clays were transferred to F-3A via an HDPE pipe. A 90-inch diameter fixed weir corrugated metal spillway riser connected to a 48-inch diameter overflow culvert was constructed through the south side of the elevated return water ditch. The overflow culvert discharged excess water from the elevated ditch into the below-grade ditch located on the south side of F-2A. The 90-inch diameter fixed weir and outfall pipe were removed and replaced with a twin fixed weir and piping system. Two new square, steel spillway structures fitted with 60-inch diameter CMP culver outfalls replaced the four old spillways which will be sealed with concrete and abandoned in the future.

Mosaic filled in and narrowed the below-grade hydraulic return channel located adjacent to the south side of CSA F-2D in order to facilitate the construction of a utility corridor. Closure of this branch of the hydraulic return channel prompted abandonment of two existing principal spillways which discharged water into the south return channel. Clarified water and storm runoff from CSA F-2D flows into a renovated (northwest) hydraulic channel located adjacent to the west wall of CSA F-2D, through two new replacement spillways located through the west wall of the dam. The northwest hydraulic channel empties into a downstream receiving (southwest) channel which routes water back to the plant area. A new outfall system consisting of a series of circular tanks and metal pipe culverts were constructed at the southern end of the west channel. The renovation project entailed the removal of a 9-foot diameter, fixed weir, steel tank, its foundation and an outfall piping.

The two new replacement spillways located north of the southwest corner of CSA F-2D transfer water from CSA F-2D to a grout-filled, fabric-lined basin in the northwest channel built along the downstream toe of the west wall of CSA F-2D. Each of the high-level spillways will consist of a 4-sided, steel-framed structure fitted with a 60-inch diameter, 10-gauge (0.138-inch) Aluminized Steel Type 2 corrugated outfall culvert. The inverts of each 60-inch spillway pipe are Elevation 174.5 feet (NGVD) and Elevation 173.5 feet (NGVD) on the upstream and downstream sides, respectively. The outflow from each spillway is controlled with eight adjustable board weirs. In the Northwest Return Channel two, 12-foot diameter, fixed weir, coated carbon steel spillway risers, each connected to a 54-inch diameter, 10-gauge Aluminized Steel Type 2 corrugated culvert are located on the south end of the channel. The Northwest Return Channel fixed spillway rims are

set at Elevation 174 feet (NGVD) and designed to operate with a minimum 5-foot dam freeboard. The 54-inch Aluminized Steel Type 2 corrugated culverts have an invert at Elevation 163 feet (NGVD). The 54-inch pipes discharge into two intermediate positions, 12-foot diameter, surge/transfer, coated carbon steel tanks, at corresponding invert Elevation 162 feet (NGVD). The intermediate tanks discharge into the final 12-foot diameter, coated carbon steel surge/transfer tanks through 42-inch diameter, smooth wall, carbon steel pipes with invert at Elevation 148 feet (NGVD). The final discharge outlet pipes consist of 48-inch diameter, 10-gauge Aluminized Steel Type 2 corrugated culverts with invert Elevations 133 and 132 feet (NGVD), respectively. The culvert system discharges water from the Northwest Return Channel into the rubble rip-rap-protected stilling basin in the below-grade Southwest Channel located at the toe of the earthen embankment.

Settling Area Compartment F-4

Settling Area F-4 is located in parts of Sections 31 and 32, Township 32 South, Range 22 East, Hillsborough County, Florida. The clay settling area is located west of the Four Corners beneficiation plant in Hillsborough County between Taylor-Gill Road and CR 39, just north of the Manatee County line. The settling area was constructed primarily over mined ground, but the south dam and south end of the west dam were constructed on a natural ground foundation.

Built originally with two compartments (F-4A and F-4B), the dams and return ditch system were completed in August 2002 and September 2003, respectively. The perimeter dam has a 2.5 Horizontal to 1.0 Vertical (2.5H.: 1.0V.) upstream slope, 3H.: 1.0V. downstream slope, and a 30-foot wide crest, at minimum inside crest elevation of 175.0 feet (NGVD). The return water ditch located alongside the eastern wall has bank slopes of 3 Horizontal to one Vertical (3H:1V) and a 15-foot wide bottom at invert Elevation 120 feet (NGVD). The design water level in the return ditch was Elevation 131 feet (NGVD).

Along the east wall where mining had occurred below the base of the dam, a horizontal sand blanket drain constructed of sand tailings was established at surface Elevation 135 feet (NGVD). The east wall blanket drain section includes an internal perforated HDPE corrugated pipe with outfall pipes and clean outs. The adjacent toe road grade is typically Elevation 137 feet (NGVD). The base out elevation (i.e., the separation between the upper well-compacted fill and the lower shaped cast overburden and/or dozer placed overburden soil fill) was built at Elevation 120 feet (NGVD). A 35-foot wide stability bench was located on the upstream toe along the mined section. The east wall has a reach that was constructed on top of unmined natural ground. This section has similar characteristics as described for the mined section with exception that the stability berm at the upstream toe was not required. The south and west dams reach that were built on natural ground have a shallow drainage swale at the toe of the dam adjacent to the toe road. The base of the 5-foot thick sand tailings drain along these reaches was set at Elevation 135 feet (NGVD). The grade of the toe road was established nominally at Elevation 137 feet (NGVD). Settling Area F-4 features two standard spillways through the east wall, each with an upstream invert elevation at 129.0 feet (NGVD).

Settling Area F-5

The settling area encompasses approximately 15,000 lineal feet of perimeter earthen embankment and a footprint of about 660 acres. F-5 has a minimum crest elevation of 150 feet (NGVD), and a maximum design fluid level at Elevation 145 feet (NGVD). The south wall of F-5 is shared with the existing Settling Area F-4 north dam. The F-5 dam was constructed within predominately mined areas using locally available overburden spoil soils and sand tailings. An above-grade return hydraulic ditch is located along the southern portion of east wall of the settling area. Three adjustable-weir decant spillway structures (located along the south section of the east wall of the settling area) discharge clarified water into the return hydraulic ditch system. Each spillway consists of a square box-type steel riser structure with 28 feet of weir length attached to a 60-inch diameter, coated, corrugated metal discharge pipe. The return hydraulic ditch water level operates at a normal elevation of 131.0 feet (NGVD).

A crest width of 30 feet was included in each design cross section. To prevent rainfall runoff from eroding the outside slope, the crest is sloped gently downwards from the outside edge to the inside edge, which forces crest drainage to the inside slope of the embankment. For the upper body of the dam constructed of compacted overburden, a slope of 2.5 H:1.0V was selected for the downstream slope. A 2.5H:1.0V slope was also chosen for the upstream slope of the compacted overburden upper body of the dam. A slope of 3.0H:1.0V was chosen for the cast and/or dozer-placed overburden on the upstream side of the dam base around the length of the embankment. For positive seepage control, a horizontal drain was constructed under the outer section of the embankment using locally available sand tailings. In areas where hydraulically-deposited sand tailings were placed within the dam foundation, the top of the sand tailings deposit was graded to tie into the adjacent horizontal blanket drain and surface water/seepage control ditches. An upstream, partially penetrating blanket of compacted overburden soil was keyed into the sand tailings foundation soils.

A return hydraulic ditch was located along the southeast corner of F-5 and tied into the return hydraulic ditch that collects supernatant from F-4. The normal operating level within the return hydraulic ditch was Elevation 131.0 (NGVD).

Three spillway structures were constructed along the east wall of F-5 to decant the supernatant water from the settling area and discharge it into the return hydraulic ditch. Each spillway consists of a square box-type steel riser structure with 28 feet of weir length attached to a 60-inch diameter, coated, corrugated metal pipe running through the embankment base.

Settling Area F-7

The construction of the Clay Settling Area F-7 (CSA F-7) earthen embankment dam occurred in three separate contract phases in southeastern Hillsborough County, Florida. The CSA site is located approximately one mile west of County Road 39 (CR 39) and a short distance north of the Manatee County line. The embankment dam was constructed on unmined and mined land with engineered fill comprised of locally-available overburden soils and sand tailings. The F-7 settling area encompasses approximately 25,466 lineal feet of perimeter earthen embankment; with a maximum ponded area of approximately 754 acres at the maximum pond design level. The settling area dam has a minimum design crest elevation of 154.0 feet above National Geodetic

Vertical Datum of 1929 (NGVD), and a normal design maximum water level of Elevation 149.0 feet (NGVD).

The contract Phase I of the F-7 settling area dam consisted of 14,750 lineal feet of perimeter earthen embankment dam; and 2,600 lineal feet of diverter wall (earthen embankment). It also consisted of the return hydraulic ditch located along the south and east walls of the settling area. Three adjustable-weir decant spillway structures (located along the east, southeast, and south portion of the settling area) will discharge clarified water into the return hydraulic ditch system. Each spillway consists of a square box-type steel riser structure attached at a 54-inch diameter, coated, corrugated metal discharge pipe. The return hydraulic ditch water level was designed to operate at a normal maximum elevation of 132 feet (NGVD).

The contract Phase II of the F-7 settling area dam consisted of 5,016 lineal feet of perimeter earthen embankment dam; 2,450 lineal feet of perimeter earthen embankment dam in the north wall, and 2,566 lineal feet of perimeter earthen embankment dam in the south wall. The contract Phase III of the F-7 settling area dam consisted of 5,700 lineal feet of perimeter earthen embankment dam tying into the Phase II segments and forming the west wall.

Settling Area L-1

IMC-Agrico constructed the Clay Settling Area (CSA) L-1 during 2005-2006 in southeast Hillsborough County. The CSA was built approximately 950 feet north of State Road 674 (SR 674) and approximately 7,000 feet east of County Road 39 (CR 39) within Sections 7 and 8, Township 32 South, Range 22 East. The settling area footprint was mined between 1990 and 1994. The perimeter dam was built of machine-placed overburden soil atop a leveled cast overburden base founded in the mine pit. The 25-foot crest was designed at a minimum elevation of 160.0 feet (NGVD). The inside and outside slopes were designed with a slope ratio of 2.5H : 1.0V, respectively. A 5-foot thick horizontal sand tailings blanket drain was built below the outer section of the dam.

Settling Area L-2

Mosaic Fertilizer, LLC (Mosaic) completed the construction of the Clay Settling Area L-2 (CSA L-2) earthen embankment dam in two separate contract phases in southeastern Hillsborough County, Florida. The CSA site is located approximately 8,000 feet east of County Road 39 (CR 39), and approximately 950 feet north of State Road 674 (SR 674). The embankment dam was principally constructed on mined land with engineered fill comprised of locally-available overburden soils and sand tailings. The L-2 settling area encompasses approximately 17,400 lineal feet of perimeter earthen embankment; with a maximum ponded area of approximately 600 acres at the maximum pond design level. It consists of south, east, and north walls (earthen embankment) and shares the east wall of existing Settling Area L-1 on the west side. The settling area dam has a minimum design crest elevation of 145.0 feet above National Geodetic Vertical Datum of 1929 (NGVD), and a design maximum water level of Elevation 140.0 feet (NGVD).

The contract Phase I of the L-2 settling area dam consisted of 13,650 lineal feet of perimeter earthen embankment dam. It also consists of 2,875 lineal feet of return hydraulic ditch located along the north wall of the settling area. Two adjustable-weir decant spillway structures (located

along the north portion of the settling area) discharge clarified water into the return hydraulic ditch system. Each spillway consists of a square box-type steel riser structure attached to a 54-inch diameter, coated, corrugated metal discharge pipe. The two spillways are equipped to discharge fluids into Area L-3.

The contract Phase II of the L-2 settling area dam consisted of 4,121 lineal feet of perimeter earthen embankment dam that keyed into the east wall of Existing Clay Settling Area L-1. It also consisted of 3,860 lineal feet of diverter wall, and 3,550 lineal feet of return hydraulic ditch continued from Phase I.

One high-level spillway was constructed through the north wall in proximity of the diverter wall to transfer L-2 pond fluids into the adjoining Area L-3. Two additional high-level spillways were constructed in the northwest corner of Area L-2 to discharge fluids into the return hydraulic ditch.

Settling Area L-3

Mosaic Fertilizer, LLC (Mosaic) completed the construction of the Clay Settling Area L-3 (CSA L-3) earthen embankment dam in southeastern Hillsborough County, Florida. The CSA site is located approximately 5,400 feet north of State Road 674 (SR 674). The embankment dam was principally constructed on mined land with engineered fill comprised of locally-available overburden soils and sand tailings. The L-3 settling area encompasses approximately 12,750 lineal feet of perimeter earthen embankment dam; with a maximum ponded area of approximately 518 acres at the maximum pond design level. It consists of west, north, and east walls (earthen embankment) and shares the north wall of existing Settling Area L-2 on the south side. The common wall (south wall for L-3) and existing wall for L-2) is approximately 6,500 lineal feet. The settling area dam has a minimum design crest elevation of 145.0 feet above National Geodetic Vertical Datum of 1929 (NGVD), and a design maximum water level of Elevation 140.0 feet (NGVD).

Settling Area L-3 is serviced by 3,050 lineal feet of return hydraulic ditch located adjacent to and along the west wall of the settling area. Two adjustable weir decant spillway structures (located along the west portion of the settling area) discharge clarified water into the return hydraulic ditch system. Each spillway consists of a square box-type steel riser structure attached to a 54-inch diameter, coated, corrugated metal discharge pipe. The return hydraulic ditch water level is designed to operate at a normal elevation of 116 feet (NGVD).

Appendix 2

FOUR CORNERS

Mining Unit	FCO MU 17E	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	301.09P		All mined areas outside CSA have been backfilled and contoured to reclamation grade.
BOCC Approval Date	1/17/2002		Area subject to Land Donation discussion.
Total Acres	2,500		
Sand Tailings / Clay Deposition	2003 - 2013	CSA in use	
Earthmoving and Contouring (Mitigation)	2004 - 2014	Complete	
Revegetation (Mitigation)	2006 - 2015	2026	All re-vegetation is complete with the exception of 120 ac of uplands
Revegetation (Access Corridor)	2016	Complete	

Mining Unit	FCO MU 19E	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	802.15P		
BOCC Approval Date	3/4/2006		
Total Acres	1,566		
Sand Tailings / Clay Deposition	2006-2015	2029	Timing adjusted due to the CSA use extension.
Earthmoving and Contouring (Mitigation)	2009-2017	2029	Areas outside of D003 outfall, filter pond and stilling basin will be contoured by 2029
Earthmoving and Contouring (Clay Ponds & Access Corridor)	2018-2021	2028	
Revegetation (Mitigation)	2009-2018	2029	
Revegetation (Clay Ponds and Access Corridor)	2019-2022	2029	

Mining Unit	FCO MU 20E	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	610.04P		
BOCC Approval Date	7/19/2011		
Total Acres	1,290		
Mining	Approval - 2016	Complete	
Sand Tailings Deposition	2015 - 2017	2024	
Earthmoving and Contouring (Mitigation)	2015 - 2019	2024	
Revegetation	2016 - 2020	2025	
Revegetation (Crossing Point K)	2018	2027	
Revegetation (Crossing Point P)	2020	2026	

LONESOME

Mining Unit	LSM MU 13 Corridor Mining	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	991.13P		
BOCC Approval Date	1/9/1990		
Total Acres	642		
Mining	2023	2025	
Sand Tailings / Clay Deposition	NA		
Earthmoving and Contouring (Mitigation)	2023-2024	2026	
Revegetation (Mitigation)	2024	2026	
Revegetation (Access Corridor)	2024	2026	

Mining Unit	LSM MU 18	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	201.01P		
BOCC Approval Date	1/11/2011		
Total Acres	1,056		
Mining (Outside Access Corridor)	2011 - 2016	Complete	approximately 70.4 acres remaining contouring associated with dragline walkpath and crossing at Taylor Gill Road
Sand Tailings	2013-2017	2025	
Earthmoving and Contouring (Mitigation)	2013-2018	Complete	
Earthmoving and Contouring (Access Corridor)	Not Listed	2026	
Revegetation (Mitigation)	2014-2018	2026	
Revegetation (Access Corridor)	Not Listed	2026	

Mining Unit	LSM MU 19	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	1106.11P		
BOCC Approval Date	8/21/2007		
Total Acres	2,067		
Mining (Outside Access Corridor)	Approval 2007 - 2012	Complete	
Mining Access Corridor	2016-2018		
Sand Tailings	2009-2020	2027	
Earthmoving and Contouring (Mitigation)	2009-2018	2027	
Earthmoving and Contouring (Access Corridor)	2017-2020	2027	
Revegetation (Mitigation)	2010-2019	2027	
Revegetation (Access Corridor)	2021	2027	

LONESOME

Mining Unit	LSM MU 20	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	408.03P		
BOCC Approval Date	12/2/2009		
Total Acres	2,213		
Mining (Outside Access Corridor)	Approval 2009 - 2017	2021	
Mining Access Corridor	2017 - 2018	2021	
Sand Tailings	2011-2021	2027	
Earthmoving and Contouring (Mitigation)	2011-2019	2027	
Earthmoving and Contouring (Access Corridor)	2018-2021	2027	
Revegetation (Mitigation)	2012-2020	2027	
Revegetation (Access Corridor)	2021	2027	

Mining Unit	LSM MU 21	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	711.03P		
BOCC Approval Date	7/24/2012		
Total Acres	2,053		
Mining	Approval - 2018	Complete	
Sand Tailings Deposition	2016-2022	2026	
Earthmoving and Contouring (Mitigation)	2017-2023	2027	
Revegetation (Mitigation)	2018-2024	2027	

Mining Unit	LSM MU 22	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	408.03P		
BOCC Approval Date	12/8/2009		
Total Acres	1,419		
Mining	Approval - 2019	Complete	
Sand Tailings Deposition	2017-2023	2024	
Earthmoving and Contouring (Mitigation)	2018-2024	2025	
Revegetation (Mitigation)	2019-2025	2025	

Mining Unit	LSM MU 23	Estimated Reclamation Schedule 7/2025	Notes:
Application Number	614.03P		
BOCC Approval Date	8/24/2015		
Total Acres	623		
Mining	2016-2020	2023	
Sand Tailings Deposition	2017-2023	NA	
Earthmoving and Contouring (Mitigation)	2018-2024	2027	
Revegetation (Mitigation)	2019-2025	2027	

COUNTY FORMS

CERTIFICATE OF ASSISTANT CORPORATE SECRETARY OF MOSAIC FERTILIZER, LLC AS TO AUTHORIZATION

The undersigned, Beth A. Paulson, does hereby certify that she is the duly elected Assistant Corporate Secretary of Mosaic Fertilizer, LLC, a Delaware limited liability company (the "Company") and further certifies as follows:

1. Russell T. Schweiss is the Sr. Director, Land and Resource Strategies for the Company.

2. In his capacity as Sr. Director, Land and Resource Strategies, Russell T. Schweiss is authorized to sign any and all documents relating to and including, but not limited to:

   a) zoning and permit applications, and other related reports and plans that are executed or filed on behalf of the Company with any city, county, regional, state or federal governmental agency or regulatory authority; and

   b) plans for reclamation, requests for release of reclamation obligations, and other related reports and plans that are executed or filed on behalf of the Company with any city, county, regional, state or federal governmental agency or regulatory authority.

3. The signature appearing below opposite Mr. Schweiss' name is a true and correct specimen of his signature:

NAME	TITLE	SIGNATURE
Russell T. Schweiss	**Sr. Director, Land and Resource Strategies**	

In witness whereof, the undersigned has executed this document effective on this 30th day of May 2024.

B. A. Paulson

Beth A. Paulson

Subscribed and sworn to before me this 30th day of May 2024.

Shawna L Bergman

Notary Public

Shawna L Bergman
Notary Public
Minnesota
My Commission Expires January 31, 2028

Combo Phosphate Mining & DRI Annual Report Application

Hillsborough County Florida

Important Instructions to All Applicants:

Please email your completed application to ZoningIntake-DSD@HCFLGov.net. Incomplete applications will not be accepted.

Official Use Only

Application No: _____ Intake Date: _____ Intake Staff Signature: _____

Receipt Number: _____ ZHM Date: _____ BOCC Date: _____

Acreage: _____ Zoning: _____ LU: _____

Location: _____

Property Information

Address: (See Page 4+) City/State/Zip: _____

TWN-RN-SEC: _____ Folio(s): _____ Acreage: _____

Current Use: _____

Property Owner Information

Name: Russell Schweiss Daytime Phone (813) 500-6891

Address: Mosaic Fertilizer, LLC 13830 Circa Crossing Drive City/State/Zip: Lithia, Florida 33547

Email: russell.schweiss@mosaicco.com Fax Number _____

Applicant Information

Name: Mosaic Fertilizer, LLC Daytime Phone (813) 500-6911

Address: 13830 Circa Crossing Drive City/State/Zip: Lithia, Florida 33547

Email: _____ Fax Number _____

Applicant's Representative (if different than above)

Name: Laney McGraw Daytime Phone (813) 500-6934

Address: Mosaic Fertilizer, LLC 13830 Circa Crossing Drive City/State/Zip: Lithia, Florida 33547

Email: laney.mcgraw@mosaicco.com Fax Number _____

DRI Information

List the DRI project name and number: Hillsborough County Consolidated Mines DRI 263

For DRI Annual Report Submittal: Anniversary Date: July 1, 2025 Reporting Period July 1 to June 30

I hereby swear or affirm that all the information provided in the submitted application packet is true and accurate, to the best of my knowledge, and authorize the representative listed above to act on my behalf on this application.

Laney C McGraw

Signature of the Applicant

Laney McGraw

Type or print name

I hereby authorize the processing of this application and recognize that the final action taken on this petition shall be binding to the property as well as to the current and any future owners.

Signature of the Owner(s) – (All parties on the deed must sign)

Russell Schweiss

Type or print name

Identification of Sensitive/Protected Information and Acknowledgement of Public Records

Hillsborough County Florida

Pursuant to Chapter 119 Florida Statutes, all information submitted to Development Services is considered public record and open to inspection by the public. Certain information may be considered sensitive or protected information which may be excluded from this provision. Sensitive/protected information may include, but is not limited to, documents such as medical records, income tax returns, death certificates, bank statements, and documents containing social security numbers.

While all efforts will be taken to ensure the security of protected information, certain specified information, such as addresses of exempt parcels, may need to be disclosed as part of the public hearing process for select applications. If your application requires a public hearing and contains sensitive/protected information, please contact Hillsborough County Development Services to determine what information will need to be disclosed as part of the public hearing process.

Additionally, parcels exempt under Florida Statutes §119.071(4) will need to contact Hillsborough County Development Services to obtain a release of exempt parcel information.

Are you seeking an exemption from public disclosure of selected information submitted with your application pursuant to Chapter 119 FS? ☐ Yes ☑ No

I hereby confirm that the material submitted with application Hillsborough County Consolidated Mines DRI 263

☐ Includes sensitive and/or protected information.

Type of information included and location _____

_____

☑ Does not include sensitive and/or protected information.

Please note: Sensitive/protected information will not be accepted/requested unless it is required for the processing of the application.

If an exemption is being sought, the request will be reviewed to determine if the applicant can be processed with the data being held from public view. Also, by signing this form I acknowledge that any and all information in the submittal will become public information if not required by law to be protected.

Signature: Laney C McGraw
(Must be signed by applicant or authorized representative)

Intake Staff Signature: _____ Date: _____

Hillsborough County Florida

Affidavit to Authorize Agent

(If applicant is other than owner)

State of Florida
County of Hillsborough

(See Page 4+ to complete statements 1-4)

(Name of all property owners), being first duly sworn, depose(s) and say(s):

1. That (I am/we are) the owner(s) and record title holder(s) of the following described property, to wit:

   Address or general location: _____ Folio No(s): (See Page 4+)

2. That this property constitutes the property for which a request for a: Annual Report Review

   _____ (Nature of request)

   is being applied to the Board of County Commissioners, Hillsborough County.

3. That the undersigned (has/have) appointed N/A as (his/their) agent(s) to execute any permits or other documents necessary to affect such permit.

4. That this affidavit has been executed to induce Hillsborough County, Florida, to consider and act on the above-described property;

5. That (I/we), the undersigned authority, hereby certify that the foregoing is true and correct.

Signed (Property Owner) _____ Signed (Property Owner)

Russell Schweiss (Authorized Representative)
Type or Print Name _____ Type or Print Name

STATE OF FLORIDA
COUNTY OF ~~HILLSBOROUGH~~ Hardee

The foregoing instrument was acknowledged before me by means of ☑ physical presence or ☐ online notarization, this 10th day of July, 2025 (year), by Russell Schweiss (name of person acknowledging).

☑ Personally Known OR ☐ Produced Identification

Type of Identification Produced _____

Joann Garza
(Signature of Notary taking acknowledgment)

Joann Garza
Type or Print Name of Notary Public

Commission number _____ Expiration date _____

Notary Public State of Florida
Joann Garza
My Commission HH 621674
Expires 12/17/2028

STATE OF FLORIDA
COUNTY OF HILLSBOROUGH

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this _____ day of _____, _____ (year), by _____ (name of person acknowledging).

☐ Personally Known OR ☐ Produced Identification

Type of Identification Produced _____

(Signature of Notary taking acknowledgment)

Type or Print Name of Notary Public

Commission number _____ Expiration date _____

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0886150000	MOSAIC FERTILIZER LLC	20.6	A;AM	A;A/M	25/31S/21E
0886160000	TAMPA ELECTRIC COMPANY	0.2	A;AM	A	25/31S/21E
0886190000	TAMPA ELECTRIC COMPANY	0.3	A;AM	A	25/31S/21E
0886230000	TAMPA ELECTRIC COMPANY	1.3	A;AM	A	25/31S/21E
0886310000	MOSAIC FERTILIZER LLC	332.9	A;AM	A;A/M;A/R	26/31S/21E
0886330000	ORTIZ NOE	0.04	A;AM	A/M;A/R	26/31S/21E
0886330025	ORTIZ DANIEL	0.07	A;AM	A/M;A/R	26/31S/21E
0886360000	TAMPA ELECTRIC COMPANY	1.0	A;AM	A;A/M	26/31S/21E
0886420100	PUCCIO CAROL SUE	0.1	AM;AR	A/M;A/R	26/31S/21E
0886420250	MCELHENY ROBERT F TRUSTEE	0.04	AM;AR	A/M;A/R	26/31S/21E
0886490050	KEENE LEON H JR	0.3	AM;AR	A/M;A/R	27/31S/21E
0886490200	SCHIRO ROBERT A	0.2	AM	A/M	27/31S/21E
0886530000	SCHIRO ROBERT A	0.1	AM	A/M;A/R	27/31S/21E
0886550000	HUDSON ROBERT H JR	0.5	AM;AR	A/M;A/R	27/31S/21E
0886560000	MOSAIC FERTILIZER LLC	476.1	AM;AR	A/M;A/R	27/31S/21E
0886580000	BUENO BRISEYDA GARCIA	0.02	AM;AR	A/M;A/R	27/31S/21E
0886600000	THOLE HEATHER S	0.3	AM;AR	A/M;A/R	27/31S/21E
0886600012	TINEO LIMITED INVESTMENTS LLC	0.04	AM	A/R	27/31S/21E
	Total Acreage:	834.1			

* If Current Zoning is PD, list PD application number as well.
** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0886600016	TINEO LIMITED INVESTMENTS LLC	0.02	AM;AR	A/R	27/31S/21E
0886600025	THOLE HEATHER S	0.02	AM;AR	A/M;A/R	27/31S/21E
0886630000	GAZI ENAYET HOSSAIN	0.06	A;AM;AR	A;A/M;A/R	28/31S/21E
0886640000	HORTELAZ JORGE	0.02	AM;AR	A/M;A/R	28/31S/21E
0886650000	HAFTEL BRIAN TRUSTEE	1.6	A;AM	A;A/M	28/31S/21E
0886660000	ALDERMAN JAMES M	1.6	A;AM	A;A/M	28/31S/21E
0886670000	MOSAIC FERTILIZER LLC	189.9	A;AM	A;A/M	28/31S/21E
0887540000	MOSAIC FERTILIZER LLC	541.7	A;AM	A/M	33/31S/21E
0887550000	COLBY WILLIAM	0.2	A;AM	A/M	33/31S/21E
0887560010	LINGERFELT DEANNA L TRUSTEE	0.2	A;AM	A/M	33/31S/21E
0887600000	MOSAIC FERTILIZER LLC	642.1	AM	A/M	34/31S/21E
0887630000	MOSAIC FERTILIZER LLC	616.8	AM	A/M	35/31S/21E
0887650000	TAMPA ELECTRIC COMPANY	1.5	A;AM	A	36/31S/21E
0887670000	DOYEN GARY MAC	0.1	AM;AR	A/M;A/R	36/31S/21E
0887680000	DOYEN GARY	0.1	AM;AR	A/M;A/R	36/31S/21E
0887680100	DOYEN GARY M	0.04	AM;AR	A/M;A/R	36/31S/21E
0887680200	DOYEN GARY M	0.04	AM;AR	A/M;A/R	36/31S/21E
0887690000	MOSAIC FERTILIZER LLC	493.0	A;AM;AR	A;A/M;A/R	36/31S/21E
	Total Acreage:	2489.0			

* If Current Zoning is PD, list PD application number as well.

** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0887710000	MOSAIC FERTILIZER LLC	651.9	AM	A/M;A/R	1/32S/21E
0887730000	MOSAIC FERTILIZER LLC	644.5	AM	A/M	2/32S/21E
0887740000	MOSAIC FERTILIZER LLC	649.2	AM	A/M	3/32S/21E
0887750000	MOSAIC FERTILIZER LLC	649.9	AM	A/M;A/R	4/32S/21E
0888270000	MOSAIC FERTILIZER LLC	477.3	AM	A;A/M	9/32S/21E
0888280000	MOSAIC FERTILIZER LLC	78.2	AM	A;A/M	9/32S/21E
0888290000	MOSAIC FERTILIZER LLC	58.1	AM	A;A/R	9/32S/21E
0888310000	MOSAIC FERTILIZER LLC	542.4	AM;AR	A;A/M;A/R	10/32S/21E
0888320000	FELLOWSHIP PRIMITIVE BAPTIST C	0.1	AM	A;A/M	9/32S/21E
0888331000	MOORE VIRGINIA LIFE ESTATE	0.1	AR	A/R	10/32S/21E
0888340100	ESCALERA JOEY	0.2	AM;AR	A/M;A/R	10/32S/21E
0888350200	FUTCH DONALD M	26.0	AM;AR	A/M;A/R	10/32S/21E
0888370075	ERCOLIN-LEWIS BRANDY	0.1	AR	A/R	10/32S/21E
0888380100	MOSAIC FERTILIZER LLC	560.2	AM;AR	A/M;A/R	11/32S/21E
0888390000	WHITLOCK JAMES C III	0.7	AM	A/M	11/32S/21E
0888390100	STEAKLEY STORMY	1.0	AM	A/M	11/32S/21E
0888390200	STEAKLEY STEVEN L	0.1	AM	A/M	11/32S/21E
0888395000	WHITLOCK JAMES C III	0.02	AM	A/M	11/32S/21E
	Total Acreage:	4340.9			

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** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0888400000	MOSAIC FERTILIZER LLC	637.4	AM	A/M;A/R	12/32S/21E
0888440000	LONESOME DOVE FARMS LLC	0.1	AM;PD	A/R	13/32S/21E
0888450000	GILL ANTHONY	0.2	AR	A/R	13/32S/21E
0888450200	LITHIA BERRY FARMS LLC	0.1	AM	A/M;A/R	13/32S/21E
0888480000	FLORIDA ACECAPADERS INC	0.1	PD	A/R;R-1	13/32S/21E
0888490000	HOLLOWELL PAULA MOORE TRUSTEE	0.03	AS-1;PD	R-1	13/32S/21E
0888530014	JUAREZ ERIC	0.02	AM	A/M;A/R	13/32S/21E
0888530016	MARTINEZ WILLIAM	0.02	AM	A/R	13/32S/21E
0888540000	KILLEBREW NORMA JEAN	0.4	AM;AR	A/M;A/R	13/32S/21E
0888550000	MOSAIC FERTILIZER LLC	238.2	AM;AR;AS-1;PD	A/M;A/R;R-1	13/32S/21E
0888550100	WILLIAMS COMMUNICATIONS INC	0.6	AM	A/R	13/32S/21E
0888560000	GILL ANTHONY	0.3	AM	A/M;A/R	13/32S/21E
0888570000	POLLOCK JONATHAN LEE LIFE ESTA	0.02	AR	A/R	13/32S/21E
0888590000	BADGEROW KELLY	0.01	AM;AR	A/R	13/32S/21E
0888590012	BOSTON DANIEL S	0.03	AM	A/R	13/32S/21E
0888590014	BOSTON BRET A	0.01	AM	A/R	13/32S/21E
0888620000	MOSAIC FERTILIZER LLC	580.9	AM;AR	A/M;A/R	14/32S/21E
0888620100	COLDING DANNY DWAYNE	10.4	AM;AR	A/M	14/32S/21E
	Total Acreage:	1468.8			

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** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0888630000	LOPEZ LUZ D	0.1	AM;AR	A/M	14/32S/21E
0888650000	COLDING DARRELL C	0.04	AM;AR	A/M	14/32S/21E
0888690000	COLDING LULA B LIFE ESTATE	0.04	AM;AR	A/M	14/32S/21E
0888700000	COLDING DANNY DWAYNE	0.1	AM;AR	A/M	14/32S/21E
0888760010	DERRYBERRY GLORIA ROCHA	0.1	AM;AR	A/M;A/R	15/32S/21E
0888770050	HAMRICK ALVA T TRUSTEE	0.5	AM;AR	A/M;A/R	15/32S/21E
0888800100	FISCHBACH FARMLAND LLC	2.9	AM;AR	A/M	15/32S/21E
0888830200	DERRYBERRY GLORIA ROCHA	0.01	AM	A/M	15/32S/21E
0888860000	MOSAIC FERTILIZER LLC	389.6	AM;AR	A/M;A/R	15/32S/21E
0888900300	NELSON SHERRY L	0.01	AR	A/R	16/32S/21E
0888900350	NELSON SHERRY L	0.02	AR	A/R	16/32S/21E
0888920000	LIGHTSEY JOEY C	0.1	AM;AR	A/M;A/R	16/32S/21E
0888950000	MOSAIC FERTILIZER LLC	600.1	AM;AR	A/M;A/R	16/32S/21E
0888960000	DRIGGERS MRS A C	0.2	AM;AR	A/M	16/32S/21E
0889380000	LOOP FARMS LLC	0.02	A	A	20/32S/21E
0889400000	LOOP FARMS LLC	0.04	A	A	20/32S/21E
0889400010	LOOP FARMS LLC	0.05	A	A	20/32S/21E
0889410000	LEFFIE M CARLTON JR FAMILY LIM	102.5	A;AM	A;A/M	20/32S/21E
	Total Acreage:	1096.4			

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** Section / Township / Range

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Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0889410100	CARLTON C DENNIS JR TRUSTEE	115.9	A;AM	A;A/M	20/32S/21E
0889420000	TAMPA ELECTRIC COMPANY	166.9	AM	A/M	21/32S/21E
0889430000	TAMPA ELECTRIC COMPANY	157.4	AM	A/M	21/32S/21E
0889440000	LEFFIE M CARLTON JR FAMILY LIM	185.0	AM	A/M	21/32S/21E
0889440050	LEFFIE M CARLTON JR FAMILY LIM	41.9	AM	A/M	21/32S/21E
0889450000	LEFFIE M CARLTON JR FAMILY LIM	76.0	AM	A/M	21/32S/21E
0889460000	LEFFIE M CARLTON JR FAMILY LIM	21.8	AM	A/M	21/32S/21E
0889540000	MOSAIC FERTILIZER LLC	605.6	AM	A/M	22/32S/21E
0889560100	CARLTON C DENNIS	19.6	AM	A/M	22/32S/21E
0889560110	CARLTON C DENNIS JR TRUSTEE	19.6	AM	A/M	22/32S/21E
0889600000	MOSAIC FERTIIZER LLC	653.1	AM	A/M	23/32S/21E
0889620000	MOSAIC FERTILIZER LLC	666.3	A;AM	A;A/M	24/32S/21E
0889640000	MOSAIC FERTILIZER LLC	659.8	AM	A/M	25/32S/21E
0889650000	MOSAIC FERTILIZER LLC	631.8	AM	A/M	26/32S/21E
0889660000	MOSAIC FERTILIZER LLC	645.4	AM	A/M	27/32S/21E
0889670000	TAMPA ELECTRIC COMPANY	81.5	AM	A/M	28/32S/21E
0889675000	LEFFIE M CARLTON JR FAMILY LIM	165.2	AM	A/M	28/32S/21E
0889676000	TAMPA ELECTRIC COMPANY	40.9	AM	A/M	28/32S/21E
	Total Acreage:	4953.7			

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** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

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Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0889680000	MOSAIC FERTILIZER LLC	367.9	AM	A/M	28/32S/21E
0889700100	CARLTON C DENNIS JR TRUSTEE	39.1	A;AM	A;A/M	29/32S/21E
0890030000	WALLISER PORK INC	0.02	A;AM	A;A/M	32/32S/21E
0890040000	HER BLA THAO	0.1	A;AM	A;A/M	32/32S/21E
0890040100	WALLISER PORK INC	0.1	A;AM	A;A/M	32/32S/21E
0890040200	NOBLES ALAN W	0.1	A;AM	A;A/M	32/32S/21E
0890120350	SANCHEZ MARIA R	0.1	A;AM	A;A/M	32/32S/21E
0890120400	BIVINS ROBERT W TRUSTEE	0.3	A;AM	A;A/M	32/32S/21E
0890120450	HARRIS JESSE	0.1	A;AM	A;A/M	32/32S/21E
0890120500	BIVINS ROBERT W TRUSTEE	0.04	A	A	32/32S/21E
0890130000	MOSAIC FERTILIZER LLC	0.6	A;AM	A;A/M	32/32S/21E
0890150000	MOSAIC FERTILIZER LLC	649.5	AM	A/M	33/32S/21E
0890160000	MOSAIC FERTILIZER LLC	642.0	AM	A/M	34/32S/21E
0890170000	MOSAIC FERTILIZER LLC	623.8	AM	A/M	35/32S/21E
0890180000	MOSAIC FERTILIZER LLC	656.8	AM	A/M	36/32S/21E
0937340000	CULPEPPER MALCOLM L TRUSTEE	0.3	AM;AR	A/R	24/30S/22E
0937340100	STRICKLAND AUSTIN T	0.4	AM;AR	A/R	24/30S/22E
0937540000	GOLDBERG ALAN L	0.01	AM;AR	A/R	24/30S/22E
	Total Acreage:	2981.3			

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** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

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Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0937550000	ALEMAN LEONARDO JR	0.04	AM;AR	A/R	24/30S/22E
0937555000	MILLER ELLEN M	0.02	AM;AR	A/R	24/30S/22E
0937630000	COOK QUINTON W	0.2	AM;AR;AS-1	R-1	24/30S/22E
0937690000	BISHOP ALLEN TRUSTEE	0.1	AM;AR;AS-1	R-1	24/30S/22E
0937700025	JURNIGAN JAMES	0.1	AM;AR	R-1	24/30S/22E
0937730000	CARRILLO JUSTIN M	0.1	AM;AR;AS-1	R-1	24/30S/22E
0937740000	MOSAIC FERTILIZER LLC	278.9	AM;AR;AS-1	A/M;A/R;R-1	24/30S/22E
0937750000	BLOMEFIELD BARBARA A	0.1	AR	R-1	24/30S/22E
0937750100	GARCIA FRANCISCO ABAD	0.1	AR	R-1	24/30S/22E
0937750200	FREITAS CIERRA RENEE	0.2	AR;AS-1	R-1	24/30S/22E
0937750300	RAMIREZ KEVIN RIVERA	0.2	AR	R-1	24/30S/22E
0937870100	CULPEPPER MALCOLM L TRUSTEE	3.5	AM	A/M;A/R	24/30S/22E
0937895010	COOK LARRY N	0.04	AM;AR;AS-1	R-1	24/30S/22E
0937895012	JACOBS MATTHEW SCOTT	0.1	AM;AR;AS-1	R-1	24/30S/22E
0937900000	MOSAIC FERTILIZER LLC	628.1	AM	A/M;R-1	25/32S/22E
0938106500	WOOLHEATER JUDITH ANNE LIFE ES	0.1	AM;AS-1	R-1	26/30S/22E
0938130000	CROUSE ABIGAIL R	0.1	AM;AR	R-1	26/30S/22E
0938190000	MOSAIC FERTILIZER LLC	702.6	AM;AR;AS-1	A/M;R-1	26/30S/22E
	Total Acreage:	1614.6			

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** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0938190200	WHITE CARY	0.1	AM;AR	A/M	26/30S/22E
0938300100	JONES FRANCIS BRUCE LIFE ESTAT	0.03	AM;AS-1	R-1	26/30S/22E
0938300200	JONES FRANCIS BRUCE LIFE ESTAT	0.02	AM;AS-1	R-1	26/30S/22E
0938300300	JONES FRANCIS BRUCE LIFE ESTAT	0.04	AM;AS-1	R-1	26/30S/22E
0938300400	JONES FRANCIS BRUCE LIFE ESTAT	0.1	AM;AS-1	R-1	26/30S/22E
0938380000	SMOTHERS JAMES	0.04	AM;AS-1	R-1	26/30S/22E
0938430402	DRIGGERS DEANNE JANINE	0.04	AM;AR;AS-1	R-1	26/30S/22E
0938430404	DRIGGERS M E	0.2	AM;AR;AS-1	A/M;R-1	26/30S/22E
0940160000	SOUTHWEST FLORIDA WATER MANAGE	1.9	A;AR	A;N	33/30S/22E
0940840000	MOSAIC FERTILIZER LLC	629.7	AM;AS-1	A/M;A/R;R-1	35/30S/22E
0940855000	DRIGGERS EARL P	0.1	AM	A/R;R-1	35/30S/22E
0940860000	CATES RICKY E	0.02	AM;AS-1	R-1	35/30S/22E
0940930000	MOSAIC FERTILIZER LLC	637.7	AM	A/M	36/30S/22E
0940960000	MOSAIC FERTILIZER LLC	1206.6	AM;AR	A/M	1/31S/22E
0940970000	MOSAIC FERTILIZER LLC	81.2	AM;AR	A/M	1/31S/22E
0940980000	MOSAIC FERTILIZER LLC	1191.1	AM;AR	A/M	2/31S/22E
0941010000	CLAYTON KATHI L	0.1	AM;AR	A/M	2/31S/22E
0941055100	SIMMONS MICHAEL T	0.2	AR	A/R	3/31S/22E
	Total Acreage:	3749.2			

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Hillsborough County Florida

Property/Project Information Sheet

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Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0941135000	VARNUM CLAYTON S	0.1	A;AR	A	3/31S/22E
0941150000	INNOVATIVE LAND MANAGEMENT LLC	57.9	AM;AR	A	3/31S/22E
0941150100	TURNER MARVIN W	21.6	A;AM;AR	A	3/31S/22E
0941200000	MOSAIC FERTILIZER LLC	109.1	AM;AR	A/M;A/R	3/31S/22E
0941200054	MCCLENDON RONALD L TRUSTEE	0.1	AR	A/R	3/31S/22E
0941200056	SIMMONS JASON C	0.1	AR	A/R	3/31S/22E
0941200215	INNOVATIVE LAND MANAGEMENT LLC	0.2	AR	A;A/R	3/31S/22E
0941200216	SEA BREEZE INVESTMENTS LLC	0.1	AR	A;A/R	3/31S/22E
0941200226	RENEW KEVIN SCOTT LIFE ESTATE	0.1	AM	A/M	3/31S/22E
0941240000	VARNUM SCOTT	469.2	A;AM;AR	A;A/R	4/31S/22E
0941240010	BARWICK HAROLD G	21.3	A;AR	A	4/31S/22E
0941240020	DAVIS MICHAEL	158.8	A;AM;AR	A;A/R;A/M	4/31S/22E
0941250000	H5 AMBER LANE LLC	1.2	A;AR	A	4/31S/22E
0941250200	AVERY ARTHUR B III	0.6	A;AR	A	5/31S/22E
0941254000	H5 AMBER LANE LLC	2.6	A;AM;AR	A;A/R;A/M	4/31S/22E
0941500000	HILL HERBERT H JR	0.1	AR	A/R	8/31S/22E
0941510000	FIRE RIVER RANCH HOUSE LLC	0.03	AM;AR	A/M	8/31S/22E
0941560100	ALEXANDER TROY A	0.1	AR	A/M;A/R	8/31S/22E
	Total Acreage:	843.2			

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Hillsborough County Florida

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Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0941580152	MOLTER URBAN J	0.1	AM;AR	A/R	8/31S/22E
0941580154	MILLER MICHAEL R	0.2	AM;AR	A/R	8/31S/22E
0941580156	STARFORD BRIAN S	0.2	AM;AR	A/R	8/31S/22E
0941580158	BLANTON STEVEN	0.1	AM;AR	A/R	8/31S/22E
0941590000	NORTH HYDE PARK PROPERTIES LLC	0.5	AR	A/M	9/31S/22E
0941600000	FIRE RIVER RANCH LLC	901.9	AM;AR	A/M;A/R	9/31S/22E
0941620000	CLAYTON KATHI L	0.2	AM;AR	A/M	9/31S/22E
0941640010	PARKER KENNETH	123.9	AM;AR	A/M	9/31S/22E
0941640020	BAKER JAMES	41.1	AM;AR	A/M	9/31S/22E
0941770000	MOSAIC FERTILIZER LLC	689.6	AM;AR	A/M;N	10/31S/22E
0941770100	MCCLENDON RONALD L TRUSTEE	20.2	AM;AR	A/M	10/31S/22E
0941810000	TIITF/REC & PARKS	556.5	AM;AR	A/M;N	10/31S/22E
0941900000	MOSAIC FERTILIZER LLC	1300.2	AM;AR	A/M;N	11/31S/22E
0941920000	MOSAIC FERTILIZER LLC	1138.6	AM;AR	A/M	12/31S/22E
0941940000	MOSAIC FERTILIZER LLC	80.8	AM	A/M	12/31S/22E
0941950000	MOSAIC FERTILIZER LLC	636.3	AM	A/M	13/31S/22E
0941960000	MOSAIC FERTILIZER LLC	597.4	AM	A/M;N	14/31S/22E
0941975000	TIITF/REC & PARKS	38.3	AM	A/M;N	14/31S/22E
	Total Acreage:	6126.1			

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Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0941980000	TIITF/REC & PARKS	264.6	AM;AR	A/M;N	15/31S/22E
0942290000	GREENWOOD MAURICE CRAIG	4.6	AM;AR	N;A/R	19/31S/22E
0942300000	GREENWOOD HARDY L LIFE ESTATE	0.01	AM;AR	N;A/R	19/31S/22E
0942380000	TIITF/REC & PARKS	260.2	AM	N	21/31S/22E
0942410000	TIITF/REC & PARKS	355.0	AM	A/M;N	22/31S/22E
0942436000	MOSAIC FERTILIZER LLC	182.4	AM	A/M	23/31S/22E
0942450000	MOSAIC FERTILIZER LLC	289.3	AM	A/M	24/31S/22E
0942470000	MOSAIC FERTILIZER LLC	85.1	AM	A/M	25/31S/22E
0942500000	TIITF/REC & PARKS	40.3	AM	A/M;N	27/31S/22E
0942515000	TIITF/REC & PARKS	126.0	AM	N	28/31S/22E
0942520000	TIITF/REC & PARKS	463.6	AM	A/M;N	29/31S/22E
0942780000	TIITF/REC & PARKS	1.9	AM;AR	A/M;N	31/31S/22E
0942790000	HILLSBOROUGH COUNTY	0.6	AM;AR	A/M;A/R	31/31S/22E
0942810000	ALAFIA BAPTIST CHURCH INC	0.3	AM;AR	A/M;A/R;N	31/31S/22E
0942840000	MOSAIC FERTILIZER LLC	201.4	AM	A/M;A/R	31/31S/22E
0942840012	STOGI RANCH LLC	0.01	AM	A/M	31/31S/22E
0942840024	WEEKS SUSAN	0.1	AM	A/M	31/31S/22E
0942850000	TIITF/REC & PARKS	17.4	AM	A/M;N	32/31S/22E
	Total Acreage:	2292.8			

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Hillsborough County Florida

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Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

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Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0942860000	MOSAIC FERTILIZER LLC	385.5	AM	A/M	32/31S/22E
0942890000	TIITF/STATE OF FLORIDA	0.4	AM	A/M	33/31S/22E
0942897000	MOSAIC FERTILIZER LLC	285.5	AM	A/M	33/31S/22E
0942906000	MOSAIC FERTILIZER LLC	37.3	AM	A/M	34/31S/22E
0943040000	MOSAIC FERTILIZER LLC	0.6	AM	A/M	2/32S/22E
0943060000	MOSAIC FERTILIZER LLC	502.8	AM	A/M	3/32S/22E
0943070000	MOSAIC FERTILIZER LLC	659.0	AM	A/M	4/32S/22E
0943080000	MOSAIC FERTILIZER LLC	643.3	AM	A/M	5/32S/22E
0943090051	MOSAIC FERTILIZER LLC	1.8	AM	A/M	31/31S/22E
0943100100	MOSAIC FERTILIZER LLC	76.9	AM	A/M;A/R	6/32S/22E
0943110000	MOSAIC FERTILIZER LLC	509.1	AM;AR	A/M;A/R	6/32S/22E
0943110016	HISCOCK RANDY	1.4	AR	A/R	6/32S/22E
0943130100	TAMPA ELECTRIC CO	0.03	AR	A/R	7/32S/22E
0943140000	MOSAIC FERTILIZER LLC	645.7	AM;AR	A/M;A/R	7/32S/22E
0943160000	MOSAIC FERTILIZER LLC	645.8	AM	A/M	8/32S/22E
0943180000	MOSAIC FERTILIZER LLC	645.7	AM	A/M	9/32S/22E
0943190000	MOSAIC FERTILIZER LLC	584.3	AM	A/M	10/32S/22E
0943210100	REYNOLDS ROBERT E	1.0	AM	A/M	10/32S/22E
	Total Acreage:	5626.1			

* If Current Zoning is PD, list PD application number as well.
** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0943220000	MOSAIC FERTILIZER LLC	1.0	AM	A/M	11/32S/22E
0943400000	MOSAIC FERTILIZER LLC	635.1	AM	A/M	13/32S/22E
0943410000	MOSAIC FERTILIZER LLC	644.2	AM	A/M	14/32S/22E
0943480000	MOSAIC FERTILIZER LLC	645.8	AM	A/M	15/32S/22E
0943550000	MOSAIC FERTILIZER LLC	634.1	AM	A/M;A/R	16/32S/22E
0943670000	MOSAIC FERTILIZER LLC	629.2	AM	A/M	17/32S/22E
0943690000	MOSAIC FERTILIZER LLC	448.3	A;AM	A;A/M;A/R	18/32S/22E
0943700000	TRAN UY Q	4.1	AM;AR	A/M;A/R	18/32S/22E
0943740100	CAPILLA FERMIN NAVA	0.3	AM	A/M	18/32S/22E
0943780000	MOSAIC FERTILIZER LLC	109.2	AM	A;A/M	19/32S/22E
0943780100	MIRABOLE HENRY TRUSTEE	98.7	A;AM	A;A/M	19/32S/22E
0943800000	MOSAIC FERTILIZER LLC	451.3	A;AM	A;A/M	19/32S/22E
0943820000	MOSAIC FERTILIZER LLC	640.3	AM	A/M	20/32S/22E
0943850000	MOSAIC FERTILIZER LLC	649.6	AM	A/M	21/32S/22E
0943850100	HILLSBOROUGH COUNTY	0.1	AM	A/M	21/32S/22E
0943920000	MOSAIC FERTILIZER LLC	656.9	AM	A/M	22/32S/22E
0943960000	MOSAIC FERTILIZER LLC	656.1	AM	A/M	23/32S/22E
0944060000	MOSAIC FERTILIZER LLC	636.0	AM	A/M	24/32S/22E
	Total Acreage:	7540.3			

* If Current Zoning is PD, list PD application number as well.
** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0944070000	MOSAIC FERTILIZER LLC	630.3	AM	A/M	25/32S/22E
0944080000	MOSAIC FERTILIZER LLC	643.8	AM	A/M	26/32S/22E
0944100000	MOSAIC FERTILIZER LLC	652.5	AM	A/M	27/32S/22E
0944150000	DONALD AND MARY SHUMAN INC	4.2	AM	A/M	28/32S/22E
0944200000	MOSAIC FERTILIZER LLC	82.7	AM	A/M	28/32S/22E
0944200100	DONALD AND MARY SHUMAN INC	0.1	AM	A/M	28/32S/22E
0944210000	DONALD AND MARY SHUMAN INC	2.1	AM	A/M	29/32S/22E
0944240000	MOSAIC FERTILIZER LLC	628.8	AM	A/M	29/32S/22E
0944250000	MOSAIC FERTILIZER LLC	595.2	AM	A/M	30/32S/22E
0944260000	SEA BREEZE INVESTMENTS LLC	97.4	AM	A/M	30/32S/22E
0944270000	MOSAIC FERTILIZER LLC	672.7	AM	A/M	31/32S/22E
0944280000	MOSAIC FERTILIZER LLC	625.2	AM	A/M	32/32S/22E
0944290000	MOSAIC FERTILIZER LLC	579.1	AM	A/M	33/32S/22E
0944290100	DONALD AND MARY SHUMAN INC	2.4	AM	A/M	33/32S/22E
0944300000	DONALD AND MARY SHUMAN INC	0.1	AM	A/M	33/32S/22E
0944310000	MOSAIC FERTILIZER LLC	644.9	AM	A/M	34/32S/22E
0944320000	MOSAIC FERTILIZER LLC	648.7	AM	A/M	35/32S/22E
0944330000	MOSAIC FERTILIZER LLC	652.0	AM	A/M	36/32S/22E
	Total Acreage:	7162.2			

* If Current Zoning is PD, list PD application number as well.
** Section / Township / Range

Hillsborough County Florida

Property/Project Information Sheet

Official Use Only

Application No:

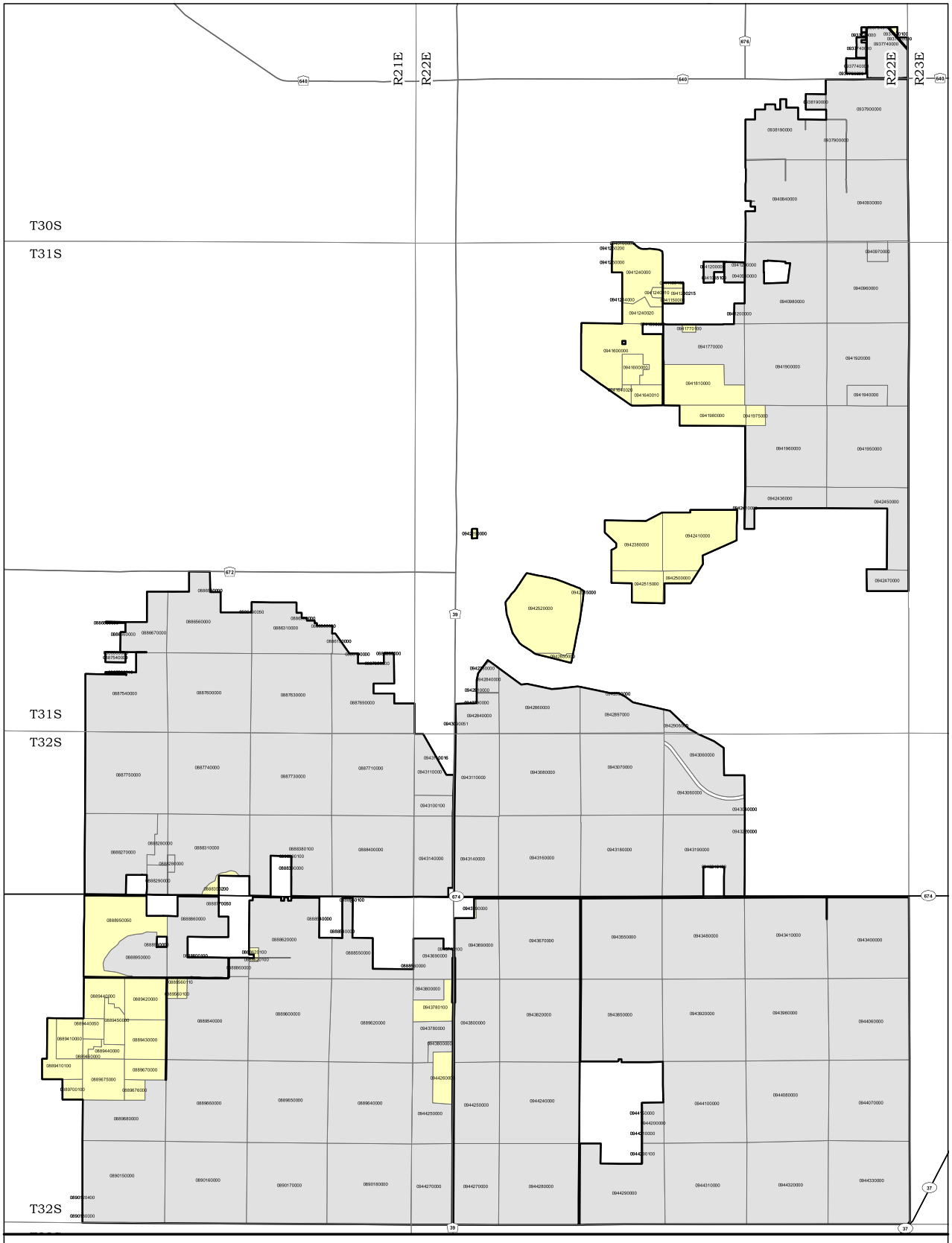
Proposed Project Name (If applicable): Hillsborough County Consolidated Mines DRI 263 Related Applications: N/A

Code Enforcement/Building Code violation No. (if applicable): N/A

List each folio within the proposed project along with the corresponding information for each (Use additional sheets if necessary).

Folio Number	Owner(s) Name(s) as listed on the deed	Acreage	Current Zoning	Future Land Use Category	S/T/R**
0888950050	Keesai Farms LLC	389.9	AM	A/M;A/R	16/32S/21E
	Total Acreage:	389.9			

* If Current Zoning is PD, list PD application number as well.
** Section / Township / Range



Legend

- County Roads
- State Roads
- Township / Range Lines

OWNER

- Mosaic Properties
- Other Properties
- DRI 263 Boundary - 48,734.0 Ac.

N
W E
S

0 6,000
Feet

Mosaic

HILLSBOROUGH COUNTY MINES

PROPERTY OWNERS
& FOLIOS

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

User: jlb Date: 7/29/2025
Path: G:\projects\2025\2025_0094\maps\Folios 2025.mxd

FINANCIAL RESPONSIBILITY

ESTIMATED FINANCIAL RESPONSIBILITY
THE MOSAIC COMPANY
HILLSBOROUGH COUNTY CONSOLIDATED MINES
REPORTING PERIOD
JULY 1, 2024 TO JUNE 30, 2025

A. Estimated Financial Responsibility Prior to July 1, 2025

I. Areas Mined and Reclaimed through Permanent Revegetation:

a. Lands Mined 31,290.3 ac.
Lands Mined Released (by FDEP) (11,047.5) ac.
Lands Reclaimed through Revegetation - Not Released (b., c. and d.) (9,203.3) ac.
Settling Areas on Unmined/Pre-1975 Mined Areas(*) 888.0 ac.
11,927.5 ac.

11,927.5 x $7,460 (**) $88,979,150

b. Reclamation Complete through Permanent Revegetation
and in One-Year Establishment (Mined Only) (Less EPC Mitigation)
(613.0 - 90.2) 5% * $7460 = $373
522.8 x $373 (***) $195,004
90.2 (Less EPC Mitigation)

c. Reclamation Complete Beyond One Year Establishment Period
for Constructed (Mined Only) (less EPC mitigation)
(9,190.5 - 2,228.1)
6,962.4 x $0 $0
2,228.1 (Less EPC Mitigation)

d. Financial Responsibility for EPC Wetland Mitigation
for Constructed and Not Released (#)(****)

1.) 1,718.1 x $7,460 $12,817,026

II. Largest Capacity Clay Settling Area - F-4 Pond (Above Grade)
(Design Capacity: 43,000 AC-FT X $1000 PER AC-FT)
43,000 x $1,000 $43,000,000

ESTIMATED TOTAL LIABILITY TO JULY 1, 2025 $144,991,180

B. Estimated Financial Responsibility July 1, 2025 to June 30, 2026

I. Area to be Mined (Projected Mining):
0.0 acres x $7,460 $0

ESTIMATED TOTAL LIABILITY THROUGH JUNE 30, 2026 $144,991,180

(*) INCLUDES UNMINED AREAS OR NON-MANDATORY AREAS UNDER CLAY SETTLING AREAS
(*****) $7,460 PER ACRE AS CALCULATED BY DECEMBER WEEK 1 2024 0.9% COST CONSTRUCTION INDEX PERCENT CHANGE
*2023/2024 COST PER ACRE OF $7,393
(***) 5% AS DESCRIBED IN LDC Sec. 8.02.10.C.1.a
(#) INCLUDES EPC MITIGATION WETLANDS CURRENTLY UNDER MONITORING

(****) 8.8 acres of mitigaiton for LMU 17 is physically located in Big Four DRI 80 boundary. This acreage was previously accounted for in DRI 263 financial assurance but now is incorporated in DRI 80 as of 2019-2020 reporting period.

HILLSBOROUGH COUNTY CONSOLIDATED MINES - MINING SUMMARY 2024/2025

MINE	MINED THRU 6/30/25 (acres)	UNMINED COVERED BY CSA (acres)	TOTAL
HCO	31,290	888	32,178

REVEGETATION SUMMARY

Mine	Reclamation Program	Program Ac.	FDEP RELEASED Mined	Dist.	Other	Total	RECLAMATION (MINED ACRES ONLY) IN 1 YR EST (A)	COMP. BEYOND 1 YR EST (B)*	TOTAL (A) & (B)
KFD									
	IMC-K-10	67	67			67			
	IMC-KC-BOG(1)	1,406	883	7		890		516	516
	IMC-KC-BOG(2)	540	439	102		541			
	IMC-KC-BOG(4)	479	296	21		317		109	109
	IMC-KC-BOG(5)	763	284	479		763			
	IMC-KC-HB(1)	428	279	69	80	428			
	IMC-KC-LB(6)	410	360	21	29	410			
	IMC-KC-MC(1A)	864	836	29		865			
	IMC-KC-MC(4)	562	430	23	110	563			
	IMC-KC-MC(6)	242	191	26	26	243			
	IMC-KC-MC(7)	243	111	38	94	243			
	IMC-KC-OB(1)	260	112	55	93	260			
	IMC-KC-SP(1)	129	126	3		129			
	IMC-KC-SPA(12)	578	226	88	263	577			
	IMC-KC-SPA(13)	287	111	121	55	287			
	IMC-KC-TMC(1)	237	126	50	61	237			
	IMC-KC-WB(1)	256	208	30	17	255			
	IMC-K-MC(2A)	533	507	27		534			
	IMC-K-MC(3)	88	70	17	1	88			
	KFD TOTAL	***8,374***	***5,662***	***1,206***	***829***	***7,697***		***625***	***625***

NON-MANDATORY RECL. & RELEASED Program	Acres
BP-L-03A*	125
BP-L-03B*	262
BP-L-04*	257
BP-L-5	150

* Lands Deeded to State

* This column excludes acres released by FDEP

Mine	Reclamation Program	Program Ac.	FDEP RELEASED				RECLAMATION (MINED ACRES ONLY)		
FCO			Mined	Dist.	Other	Total	IN 1 YR EST (A)	COMP. BEYOND 1 YR EST (B)	TOTAL (A) & (B)
	IMC-FCL-AC(1)	2,794						750	750
	IMC-FCL-AC(3A)	414	346	11		357		10	10
	IMC-FCL-AC(4A)	944	446	65	36	547		307	307
	IMC-FCL-AC(5)	391	215	31		246		5	5
	IMC-FCL-AC(6)	364	304	60		364			
	IMC-FCL-AC(7A)	314	44	46	6	96		94	94
	IMC-FCL-AC(8)	2,179						51	51
	IMC-FCL-HPB(10)	150						87	87
	IMC-FCL-HPB(11)	118					64		64
	IMC-FCL-HPB(12)	118					13		13
	IMC-FCL-HPB(1A)	3						1	1
	IMC-FCL-HPB(2A)	28							
	IMC-FCL-HPB(4)	607					15	282	297
	IMC-FCL-HPB(5)	391						18	18
	IMC-FCL-HPB(6A)	632					69	362	431
	IMC-FCL-HPB(7A)	1,089							
	IMC-FCL-HPB(8)	272						234	234
	IMC-FCL-HPB(9)	474						331	331
	IMC-FCL-HUC(1A)	282						70	70
	IMC-FCL-HUC(2)	37							
	IMC-FCL-HUC(3)	666					0	555	555
	IMC-FCL-HUC(4)	436	91	25	28	144		204	204
	IMC-FCL-HUC(5)	240						74	74
	IMC-FCL-LEB(2)	424					9	371	380
	IMC-FCL-LEB(3A)	886					180	65	244
	IMC-FCL-LMR(10)	262					13	171	184
	IMC-FCL-LMR(11)	105			105				
	IMC-FCL-LMR(12A)	571			150		91	126	217
	IMC-FCL-LMR(13)	300						218	218
	IMC-FCL-LMR(14)	150							
	IMC-FCL-LMR(15A)	640					23	142	165
	IMC-FCL-LMR(16A)	243						181	181
	IMC-FCL-LMR(17)	329						210	210

* This column excludes acres released by FDEP

Mine	Reclamation Program	Program Ac.	FDEP RELEASED				RECLAMATION (MINED ACRES ONLY) IN	COMP. BEYOND	TOTAL
			Mined	Dist.	Other	Total	1 YR EST (A)	1 YR EST (B)	(A) & (B)
FCO	IMC-FCL-LMR(18)	36							
(Con't.)	IMC-FCL-LMR(19)	733					7	513	520
	IMC-FCL-LMR(20)	184					0	104	104
	IMC-FCL-LMR(21)	169					1		1
	IMC-FCL-LMR(22)	76							
	IMC-FCL-LMR(23)	87							
	IMC-FCL-LMR(24)	369						294	294
	IMC-FCL-LMR(25)	200						86	86
	IMC-FCL-LMR(26)	267						190	190
	IMC-FCL-LMR(27)	224						127	127
	IMC-FCL-LMR(28)	144						62	62
	IMC-FCL-LMR(29A)	45							
	IMC-FCL-LMR(31)	122						90	90
	IMC-FCL-LMR(32)	109							
	IMC-FCL-LMR(33)	40							
	IMC-FCL-LMR(3A)	434	291	74	2	367		33	33
	IMC-FCL-LMR(4)	1,035	727	71	2	800		167	167
	IMC-FCL-LMR(5)	699						411	411
	IMC-FCL-LMR(6)	1,044	448	242		690		85	85
	IMC-FCL-LMR(7)	728	543	123	54	719			
	IMC-FCL-LMR(8)	519						358	358
	IMC-FCL-LMR(9)	81							
	IMC-FCL-LOB(5)	62							
	IMC-FCL-PB(1A)	245					0	148	148
	IMC-FCL-PB(2A)	225						103	103
	IMC-FCL-PB(3)	137						121	121
	IMC-FCL-PB(4A)	133						19	19
	IMC-FCL-PB(5)	369						185	185
	IMC-FCL-PB(6A)	420					75		75
	IMC-FCL-PB(7A)	474					53		53
	IMC-FCL-PC(1A)	487	483	4		487			
	IMC-FCL-PC(3)	855	674	83		757			
	IMC-FCL-SPAR(1)	414	85	34	27	146		120	120

* This column excludes acres released by FDEP

Mine	Reclamation Program	Program Ac.	FDEP RELEASED Mined	Dist.	Other	Total	RECLAMATION (MINED ACRES ONLY) IN 1 YR EST (A)	COMP. BEYOND 1 YR EST (B)	TOTAL (A) & (B)
FCO	IMC-FCL-SPAR(2)	402							
(Con't.)	IMC-FCL-SPAR(3)	240						75	75
	IMC-FCL-SPAR(4)	1,238						12	12
	IMC-FCL-SPAR(5)	244						186	186
	IMC-FCL-SPAR(6)	0							
	IMC-L-LMR(1B)	131						65	65
	IMC-L-LMR(2)	730						3	3
	IMC-L-LMR(30)	306						27	27
	MOS-FCL-HUC(6)	77						67	67
	PLANT SITE	148							
	FCO TOTAL	***31,535***	***4,697***	***868***	***410***	***5,720***	***613***	***8,565***	***9,178***

Mine	Reclamation Program	Program Ac.	FDEP RELEASED Mined	Dist.	Other	Total	RECLAMATION (MINED ACRES ONLY) IN 1 YR EST (A)	COMP. BEYOND 1 YR EST (B)	TOTAL (A) & (B)
BP-LSM									
	BP-L-1	2	2			2			
	BP-L-2	2	2			2			
	BP-L-4A	1	1			1			
	BP-L-85(4)	1		1		1			
	BP-L-SP(11A)								
	BP-L-SP(2A)	371	288	83		371			
	BP-L-SP(5)	6	5	1		6			
	BP-L-SP(8)	485	391	94		485			
	BP-LSM TOTAL	***868***	***689***	***179***		***868***			
	HILLS CO. MINES TOTAL	***40,776***	***11,048***	***2,253***	***1,239***	***14,285***	***613***	***9,190***	***9,803***

* This column excludes acres released by FDEP

Mine	Within	Mitigation For	Constructed, Monitored	Constructed, not Monitored	Not Constructed	Released by EPC	Total Acres
FCO	LMU 13	LMU 13, 14, 16, 17				26.7	26.7
	LMU 13 Total					**26.7**	**26.7**
	LMU 14	LMU 13, 14, 16, 17	16.4			9.2	25.7
		LMU 14			12.1		12.1
	LMU 14 Total		**16.4**		**12.1**	**9.2**	**37.8**
	LMU 16	LMU 13, 14, 16, 17	64.0		61.6	59.2	184.8
	LMU 16 Total		**64.0**		**61.6**	**59.2**	**184.8**
	LMU 17	LMU 13, 14, 16, 17	69.4			26.2	95.6
	LMU 17 Total		**69.4**			**26.2**	**95.6**
	LMU 18	BASEBALL				1.4	1.4
		Crossing O			0.4		0.4
		LMU 18	0.5	7.9	0.0		8.4
	LMU 18 Total		**0.5**	**7.9**	**0.4**	**1.4**	**10.2**
	LMU 19	LMU 19			17.7		17.7
	LMU 19 Total				**17.7**		**17.7**
	LMU 20	LMU 19A		3.1			3.1
		LMU 20	23.9	48.4	73.5		145.9
		LMU 21			0.3		0.3
		LMU 22			21.0		21.0
	LMU 20 Total		**23.9**	**51.5**	**94.8**		**170.2**
	LMU 21	LMU 21	35.6	3.3	76.1		115.0
		LMU 21A		0.1			0.1
		MU 20E	1.5				1.5
	LMU 21 Total		**37.1**	**3.4**	**76.1**		**116.6**
	LMU 22	LMU 21		18.4			18.4
		LMU 22	27.8	71.9	0.3		99.9
	LMU 22 Total		**27.8**	**90.3**	**0.3**		**118.4**
	LMU 23	LMU 13, 14, 16, 17			7.9		7.9
	LMU 23 Total				**7.9**		**7.9**
	LMU21	LMU 21			23.1		23.1
	LMU21 Total				**23.1**		**23.1**
	MU 1	MU 4			12.2		12.2
	MU 1 Total				**12.2**		**12.2**
	MU 10	MU 10				25.8	25.8
	MU 10 Total					**25.8**	**25.8**
	MU 11E	LMU 13, 14, 16, 17				7.6	7.6
		MU 11E				14.7	14.7
		MU 14E				26.1	26.1
		MU 19E				5.0	5.0
	MU 11E Total					**53.4**	**53.4**
	MU 12E	MU 14E			7.3		7.3
	MU 12E Total				**7.3**		**7.3**
	MU 13	Crossing O	1.5		0.3		1.8
		MU 13E	55.0			76.0	131.0
		MU 14E	7.0				7.0
		MU 15E	1.2			10.1	11.3
		MU 16E				37.0	37.0
		MU 18E	17.3		20.0	17.0	54.4

* This column excludes acres released by FDEP

	MU 19E				3.8	3.8
MU 13 Total		**82.1**		**20.3**	**143.9**	**246.4**
MU 13A	MU 8A				0.6	0.6
MU 13A Total					**0.6**	**0.6**
MU 14E	MU 14E	66.3		45.8	89.0	201.1
MU 14E Total		**66.3**		**45.8**	**89.0**	**201.1**
MU 15E	MU 14E				8.6	8.6
	MU 15E				45.2	45.2
	MU 17E				38.0	38.0
	MU 19E	5.3	0.8		3.5	9.6
MU 15E Total		**5.3**	**0.8**		**95.3**	**101.4**
MU 17E	MU 14E	4.9			32.4	37.3
	MU 17E	110.4			23.8	134.2
	MU 18E	9.0				9.0
	MU 19E	4.4				4.4
MU 17E Total		**128.7**			**56.1**	**184.8**
MU 19E	Crossing L				2.0	2.0
	LMU 19	2.8			22.9	25.8
	MU 19E	98.3		1.0	51.0	150.4
	MU 20E	7.9				7.9
MU 19E Total		**109.0**		**1.0**	**75.9**	**186.0**
MU 2	MU 3			0.4		0.4
MU 2 Total				**0.4**		**0.4**
MU 20E	LMU 22	6.9		0.8		7.7
	MU 20E	56.2	57.2	34.2		147.6
MU 20E Total		**63.1**	**57.2**	**35.0**		**155.3**
MU 3	MU 3			286.1		286.1
MU 3 Total				**286.1**		**286.1**
MU 4	MU 4			216.2		216.2
MU 4 Total				**216.2**		**216.2**
MU 5	MU 6				115.1	115.1
MU 5 Total					**115.1**	**115.1**
MU 6	LMU 13, 14, 16, 17				1.9	1.9
	MU 6				94.9	94.9

* This column excludes acres released by FDEP

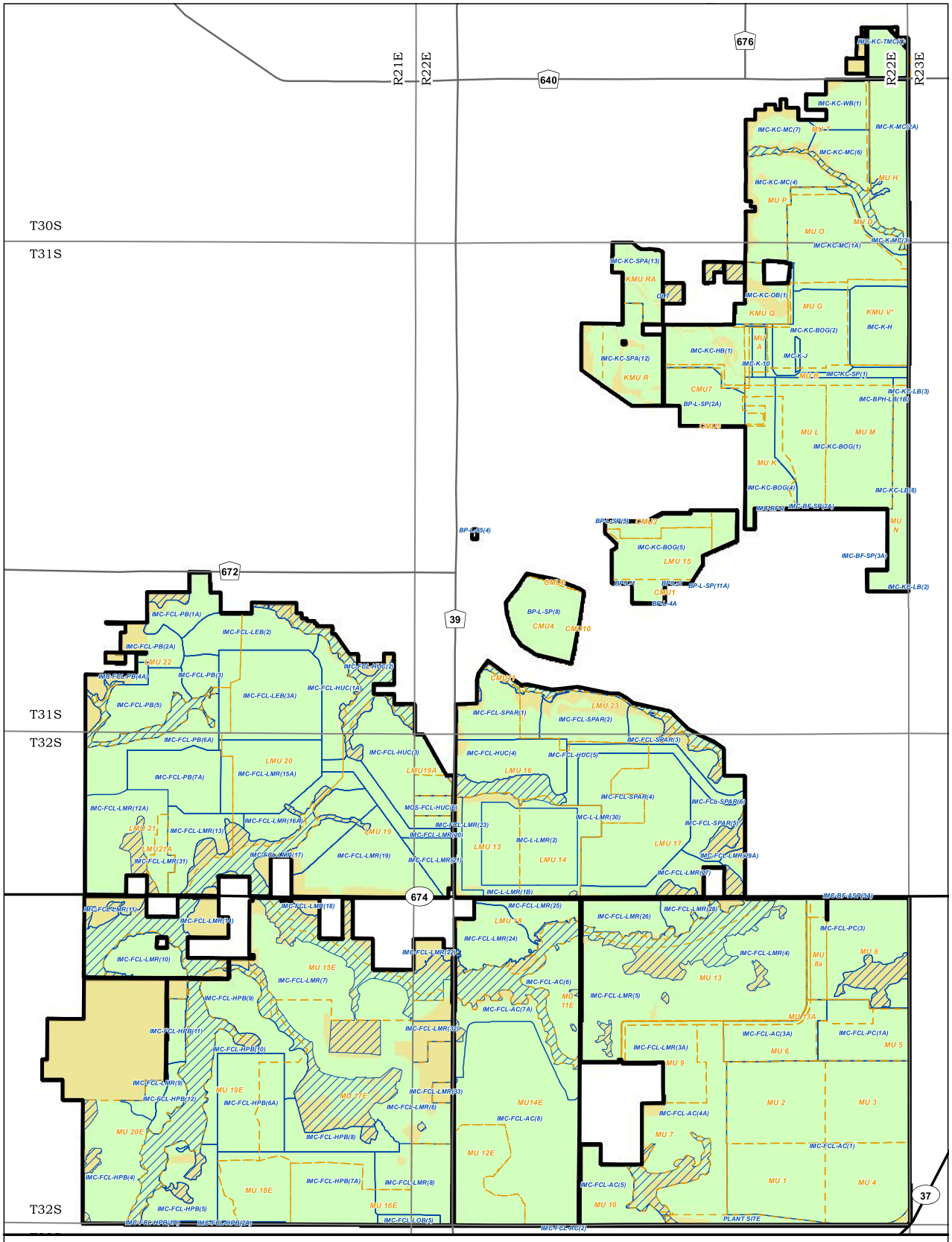
	MU 6 Total					**96.9**	**96.9**
	MU 7	MU 7				340.2	340.2
	MU 7 Total					**340.2**	**340.2**
	MU 8	MU 6				0.4	0.4
		MU 8				91.5	91.5
		MU 8A				9.9	9.9
	MU 8 Total					**101.8**	**101.8**
	MU 8a	MU 8A				8.2	8.2
	MU 8a Total					**8.2**	**8.2**
	MU 9	MU 7				0.0	0.0
		MU 9				121.4	121.4
	MU 9 Total					**121.5**	**121.5**
	ND	BASEBALL				2.0	2.0
		MU 14E				55.0	55.0
	ND Total					**57.0**	**57.0**
FCO Total			**693.8**	**211.1**	**918.5**	**1503.3**	**3326.7**
KFD	KMU R	KMU R	30.1			31.5	61.6
	KMU R Total		**30.1**			**31.5**	**61.6**
	KMU R-A	KMUR A				14.5	14.5
	KMU R-A Total					**14.5**	**14.5**
	KMUR A	KMUR A				1.2	1.2
	KMUR A Total					**1.2**	**1.2**
	MU B	LMU 13, 14, 16, 17	5.1				5.1
	MU B Total		**5.1**				**5.1**
	MU H	MU H				9.0	9.0
	MU H Total					**9.0**	**9.0**
	MU K	LMU 13, 14, 16, 17	8.2			7.5	15.7
		MU K	81.1				81.1
	MU K Total		**89.3**			**7.5**	**96.8**
	MU L	LMU 13, 14, 16, 17	115.9				115.9
		MU K	19.1				19.1
	MU L Total		**135.0**				**135.0**

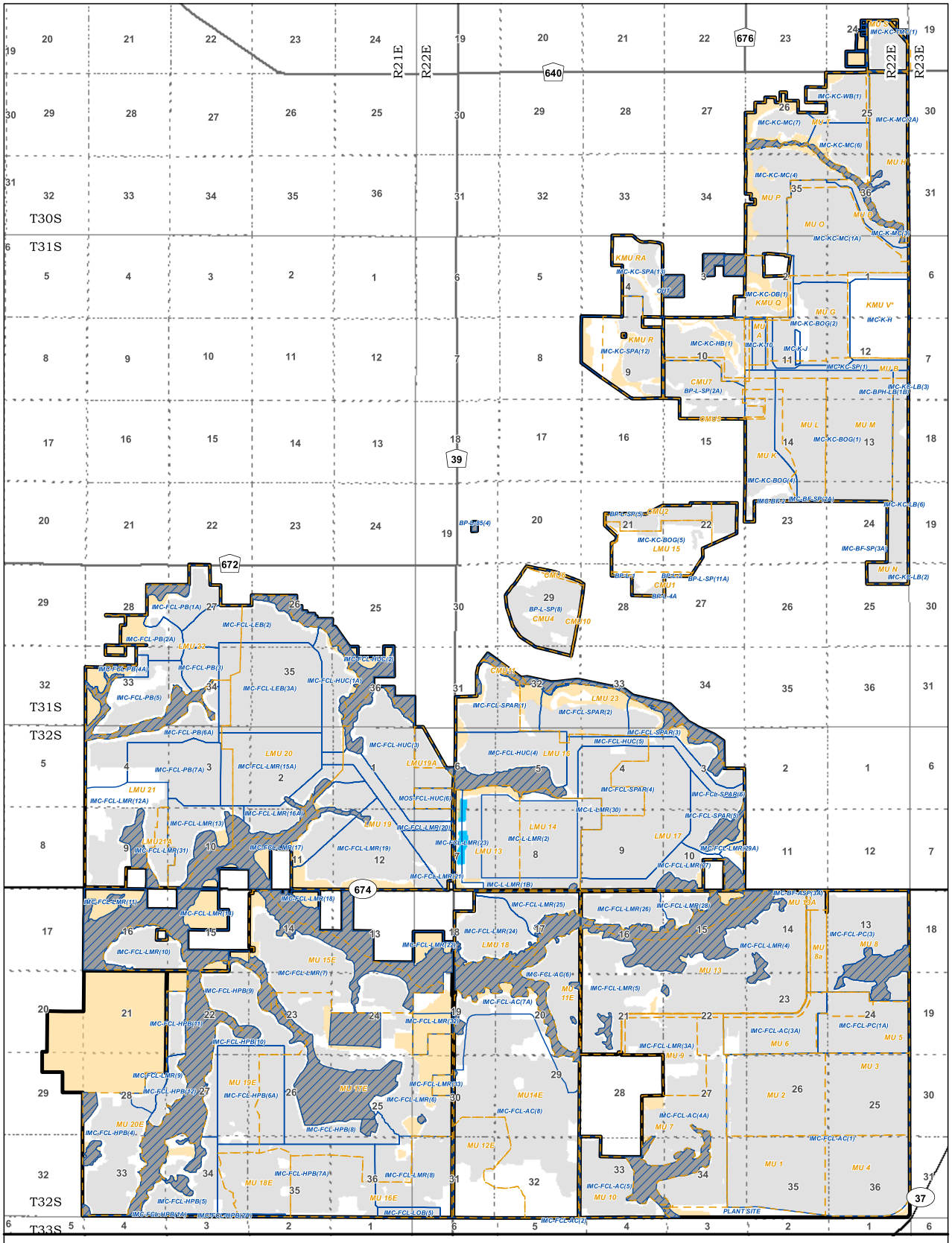
* This column excludes acres released by FDEP

	MU M	LMU 13, 14, 16, 17	5.2				5.2
		MU K	50.5				50.5
	MU M Total		**55.7**				**55.7**
	MU P	MU P	3.3			13.1	16.4
	MU P Total		**3.3**			**13.1**	**16.4**
	MU S	MU S				16.9	16.9
	MU S Total					**16.9**	**16.9**
	MU T	MU T	37.9			4.0	41.9
	MU T Total		**37.9**			**4.0**	**41.9**
KFD Total			**356.4**			**97.6**	**454.0**
LSM	LMU 16	LMU 13, 14, 16, 17				9.7	9.7
	LMU 16 Total					**9.7**	**9.7**
	LMU 18	LMU 14	12.1				12.1
		LMU 18	87.4				87.4
		LMU 19	27.2				27.2
	LMU 18 Total		**126.7**				**126.7**
	LMU 19	Hurrah Creek (Off-Site)		3.3			3.3
		LMU 19	138.6	7.9		15.2	161.7
		LMU 19A	4.4				4.4
		MU 19E	20.4				20.4
	LMU 19 Total		**163.4**	**11.1**		**15.2**	**189.8**
	LMU 19A	LMU 19	3.7				3.7
	LMU 19A Total		**3.7**				**3.7**
	LMU 21	LMU 21	34.3				34.3
	LMU 21 Total		**34.3**				**34.3**
	LMU21	LMU 21			1.2		1.2
	LMU21 Total				**1.2**		**1.2**
	LMU23	LMU 22			70.8		70.8
	LMU23 Total				**70.8**		**70.8**
	ND	Crossing O			0.7		0.7
		LMU 21			9.7		9.7
	ND Total				**10.4**		**10.4**
LSM Total			**328.1**	**11.1**	**82.4**	**24.9**	**446.6**
Grand Total			**1378.3**	**222.2**	**1000.9**	**1625.8**	**4227.3**

* This column excludes acres released by FDEP

SECTION 4
MAPS


R21E
R22E
R22E
R23E
T30S
T31S
T31S
T32S
T32S
676
640
672
39
674
37
IMC-KC-TMC(3)
IMC-KC-WB(1)
IMC-KC-MC(7)
MU I
IMC-K-MC(3A)
IMC-KC-MC(6)
IMC-KC-MC(4)
MU H
MU P
MU O
MU D
IMC-K-MC(2)
IMC-KC-MC(1A)
IMC-KC-SPA(13)
KMU RA
IMC-KC-OB(1)
KMU Q
MU G
KMU V*
IMC-K-H
IMC-KC-BOG(2)
MU A
IMC-K-J
IMC-KC-HB(1)
IMC-K-10
IMC-KC-SPA(12)
KMU R
MU B
IMC-KC-SP(1)
IMC-KC-LB(3)
IMC-BPH-LB(1B)
CMU7
BP-L-SP(2A)
CMU6
MU L
MU M
IMC-KC-BOG(1)
MU K
IMC-KC-BOG(4)
IMC-KC-LB(6)
IMC-BF-SP(2A)
MU N
BP-L-SP(5)
CMU2
IMC-KC-BOG(5)
LMU 15
IMC-BF-SP(3A)
BP-L-SP(11A)
IMC-KC-LB(2)
CMU1
BP-L-SP(4A)
BP-L-SP(4)
CMU5
BP-L-SP(8)
CMU4
CMU10
CMU3
IMC-FCL-PB(1A)
IMC-FCL-LEB(2)
IMC-FCL-PB(2A)
LMU 22
IMC-FCL-PB(4A)
IMC-FCL-PB(3)
IMC-FCL-HUC(2)
IMC-FCL-HUC(1A)
IMC-FCL-LEB(3A)
IMC-FCL-PB(5)
IMC-FCL-SPAR(1)
LMU 23
IMC-FCL-SPAR(2)
IMC-FCL-PB(6A)
IMC-FCL-SPAR(3)
IMC-FCL-HUC(3)
IMC-FCL-HUC(4)
IMC-FCL-HUC(5)
LMU 20
IMC-FCL-LMR(15A)
LMU19A
LMU 16
IMC-FCL-PB(7A)
IMC-FCL-SPAR(4)
IMC-FCL-LMR(12A)
IMC-FCL-SPAR(5)
MOS-FCL-HUC(6)
IMC-L-LMR(30)
IMC-FCL-SPAR(6)
IMC-FCL-LMR(23)
IMC-FCL-LMR(16A)
LMU 21
IMC-FCL-LMR(13)
LMU 19
IMC-FCL-LMR(20)
IMC-L-LMR(2)
LMU 13
LMU 17
LMU21A
IMC-FCL-LMR(17)
IMC-FCL-LMR(19)
IMC-FCL-LMR(31)
IMC-FCL-LMR(21)
LMU 14
IMC-FCL-LMR(29A)
IMC-FCL-LMR(27)
IMC-L-LMR(1B)
IMC-BF-ASR(2A)
IMC-FCL-LMR(11)
IMC-FCL-LMR(18)
IMC-FCL-LMR(25)
IMC-FCL-LMR(26)
IMC-FCL-LMR(28)
IMC-FCL-PC(3)
IMC-FCL-LMR(14)
LMU 18
IMC-FCL-LMR(24)
IMC-FCL-LMR(4)
IMC-FCL-LMR(10)
IMC-FCL-LMR(22)
MU 8
MU 8a
MU 15E
MU 13
IMC-FCL-LMR(7)
IMC-FCL-AC(6)
IMC-FCL-HPB(9)
MU 11E
IMC-FCL-LMR(5)
IMC-FCL-AC(7A)
MU 13A
IMC-FCL-HPB(11)
IMC-FCL-LMR(32)
IMC-FCL-AC(3A)
IMC-FCL-PC(1A)
IMC-FCL-HPB(10)
IMC-FCL-LMR(3A)
MU 5
MU 6
IMC-FCL-LMR(9)
MU 9
MU 19E
MU 17E
IMC-FCL-LMR(33)
IMC-FCL-HPB(12)
IMC-FCL-HPB(6A)
IMC-FCL-LMR(6)
MU14E
IMC-FCL-AC(8)
IMC-FCL-AC(4A)
MU 2
MU 3
MU 20E
IMC-FCL-HPB(8)
MU 7
IMC-FCL-AC(1)
MU 12E
IMC-FCL-HPB(4)
IMC-FCL-HPB(7A)
IMC-FCL-LMR(8)
IMC-FCL-AC(5)
MU 1
MU 4
MU 18E
MU 16E
MU 10
IMC-FCL-HPB(5)
IMC-FCL-LOB(5)
PLANT SITE
IMC-FCL-AC(2)
Legend
County Roads
State Roads
Township / Range Lines
Mining Unit Boundaries
LRU Boundaries
Non-Disturbed
DRI 263 Boundary - 48,734.0 Ac.
DRI 263 Tract-Area not Mined
* KMU V was never approved by the County and was not mined after 1975
N
W
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6,000
Feet
Mosaic
HILLSBOROUGH COUNTY MINES
MAP 1
BOUNDARY
2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY
User: jlb Date: 7/31/2025
Path: G:\projects\2025\2025_0094\maps\map1-boundary.mxd



Legend

- Mining Unit Boundaries
- LRU Boundaries
- Non-Disturbed
- Mined 2024-2025 - 37.3 ac
- Mined Prior
- DRI 263 Tract-Area not Mined
- DRI Boundary
- State Roads
- County Roads
- Township / Range Lines
- Section Lines

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0 6,000 Feet

Mosaic

HILLSBOROUGH COUNTY MINES

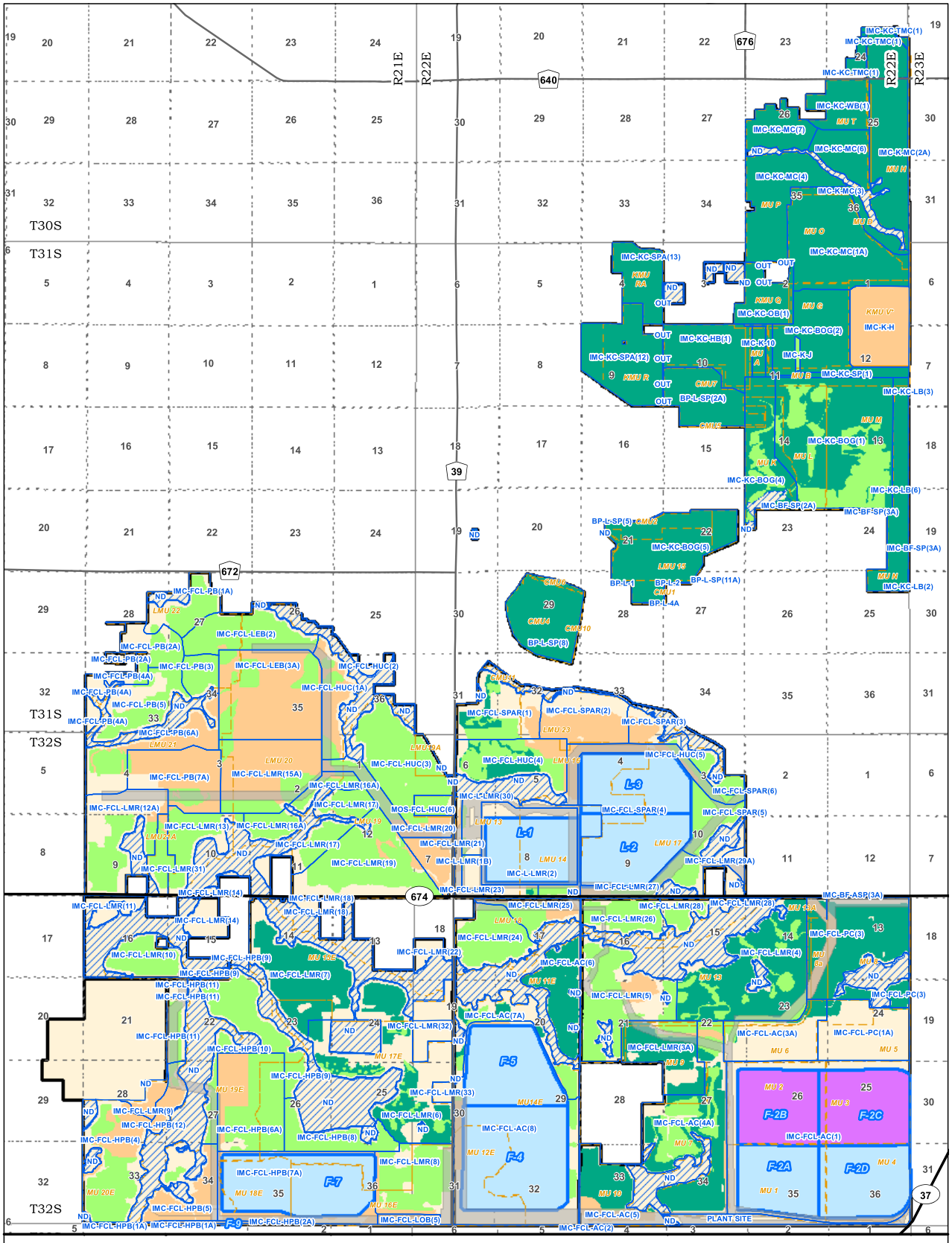
MAP 2
PREVIOUS AND PROPOSED MINING

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

No mining proposed July 2025 through June 2026

*KMU V was never approved by the County and was not mined after 1975

User: jlb Date: 7/31/2025
Path: G:\projects\2025\2025_0094\maps\map2-mining.mxd



* KMU V was never approved by the County and was not mined after 1975

Legend

- State Roads
- County Roads
- Township / Range Lines
- Section Lines
- LRU Boundaries
- Mining Unit Boundaries
- Access Corridors
- DRI Boundary
- DRI 263 Tract-Area not Mined
- Non-Disturbed
- Not Fully Reclaimed
- Reclaimed
- Released by FDEP
- Active CSA
- Inactive CSA

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Feet

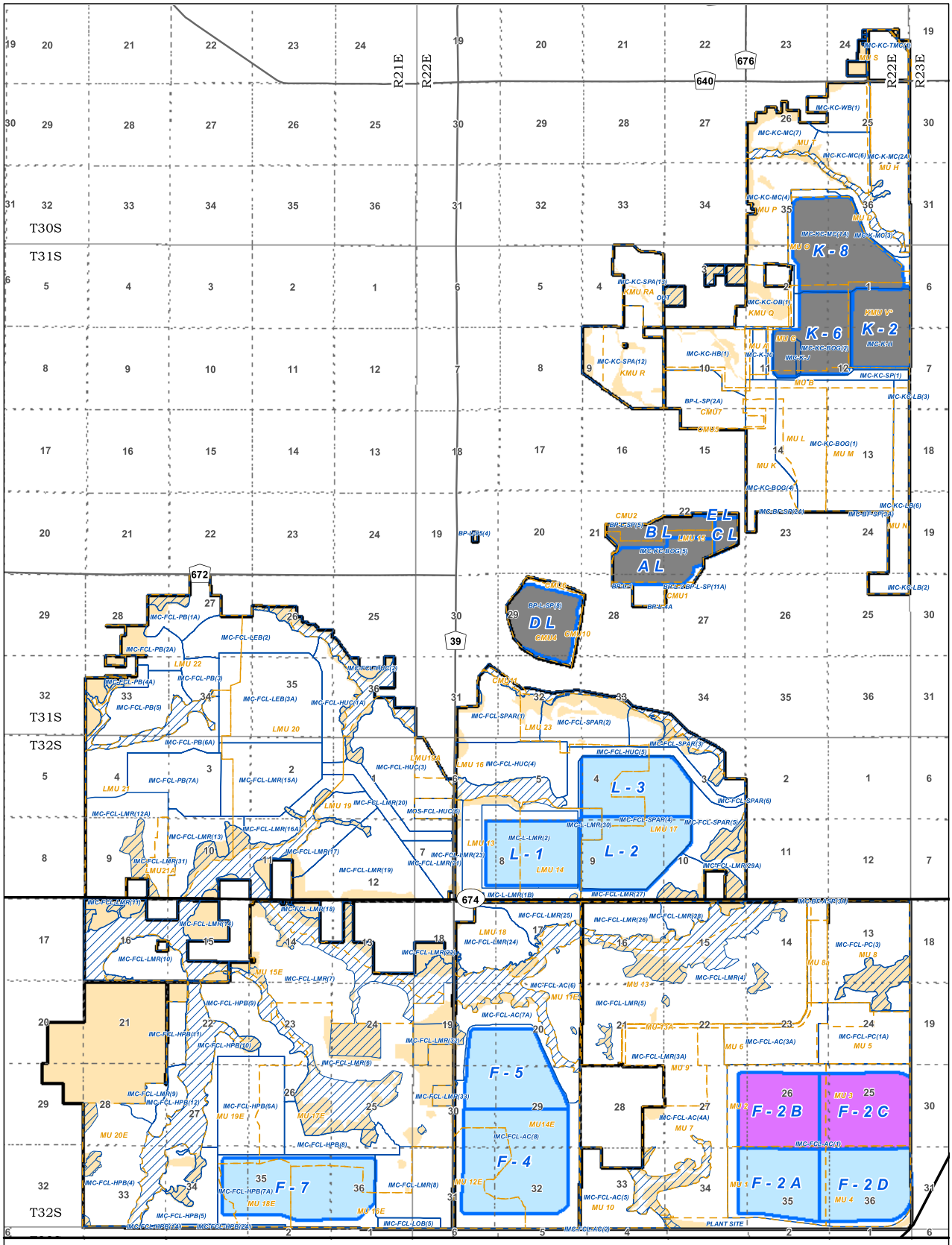
Mosaic

HILLSBOROUGH COUNTY MINES

MAP 3
FDEP RECLAMATION PROGRESS

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

User: jlb Date: 7/31/2025
Path: G:\projects\2025\2025_0094\maps\map3-recprog.mxd



Legend

- State Roads
- County Roads
- Township / Range Lines
- Section Lines
- DRI Boundary
- DRI 263 Tract-Area not Mined
- Mining Unit Boundaries
- LRU Boundaries
- Non-Disturbed

Clay Settling Areas

- Active
- Inactive
- Abandoned

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Mosaic

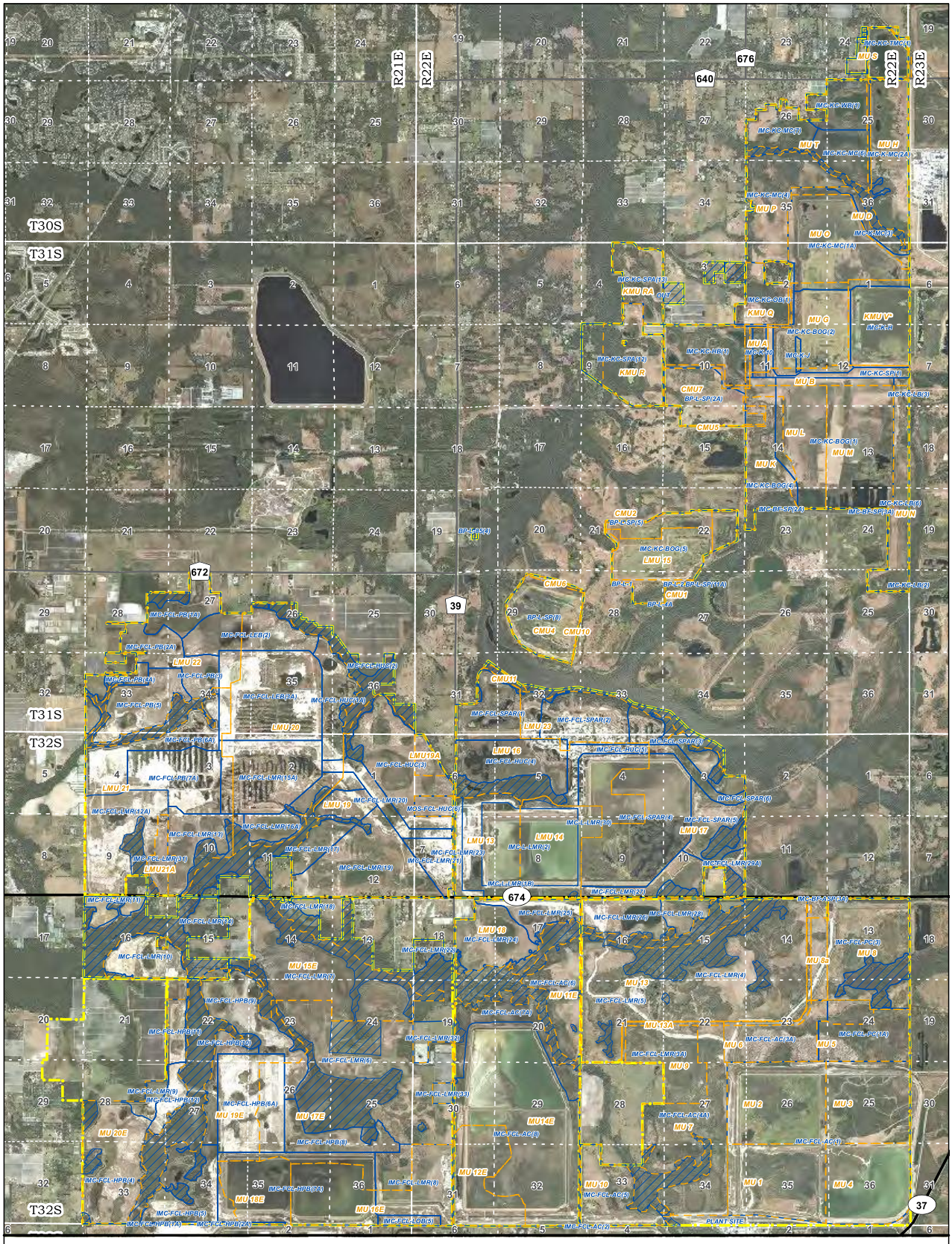
HILLSBOROUGH COUNTY MINES

MAP 4
CLAY SETTLING AREAS

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

User: jlb Date: 6/23/2025
Path: G:\projects\2025\2025_0094\maps\map4-csa.mxd

* KMU V was never approved by the County and was not mined after 1975



Legend

- Township / Range Lines
- Section Lines
- State Roads
- County Roads
- Mining Unit Boundaries
- LRU Boundaries
- Non-Disturbed
- DRI Boundary

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W E
S

0 6,000
Feet

Mosaic

HILLSBOROUGH COUNTY MINES

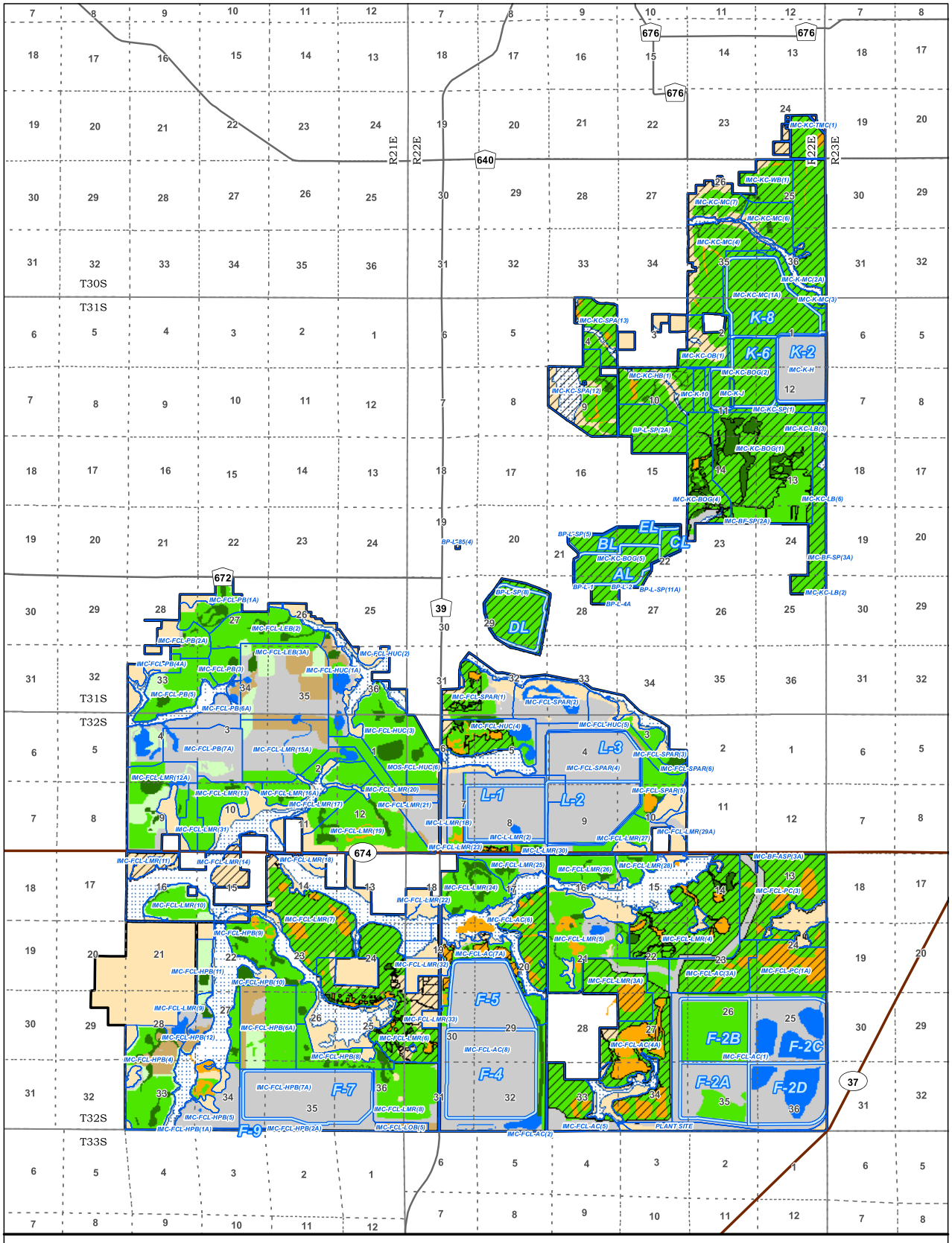
MAP 5
AERIAL PHOTOGRAPH

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

Aerial Flown: December 2024

* KMU V was never approved by the County and was not mined after 1975

User: jlb Date: 6/23/2025
Path: G:\projects\2025\2025_0094\maps\map5-aerial.mxd



Legend

- LRU Boundaries
- State Roads
- County Roads
- Township / Range Lines
- Section Lines
- DRI Boundary
- Clay Settling Areas
- Released by FDEP
- EPC Mitigation Constructed, Released by EPC
- EPC Mitigation Constructed, Not Released (As-Built Received and/or Monitored)
- Not Planned for Disturbance
- EPC Mitigation, not Constructed
- Reclamation Complete and in One Year Establishment
- Reclamation Complete Beyond One Year Establishment
- Reclamation Work in Progress (Contoured)
- Areas Mined or Disturbed and Not Reclaimed
- DRI 263 Tract-Area not Mined

N W E S

0 6,000 Feet

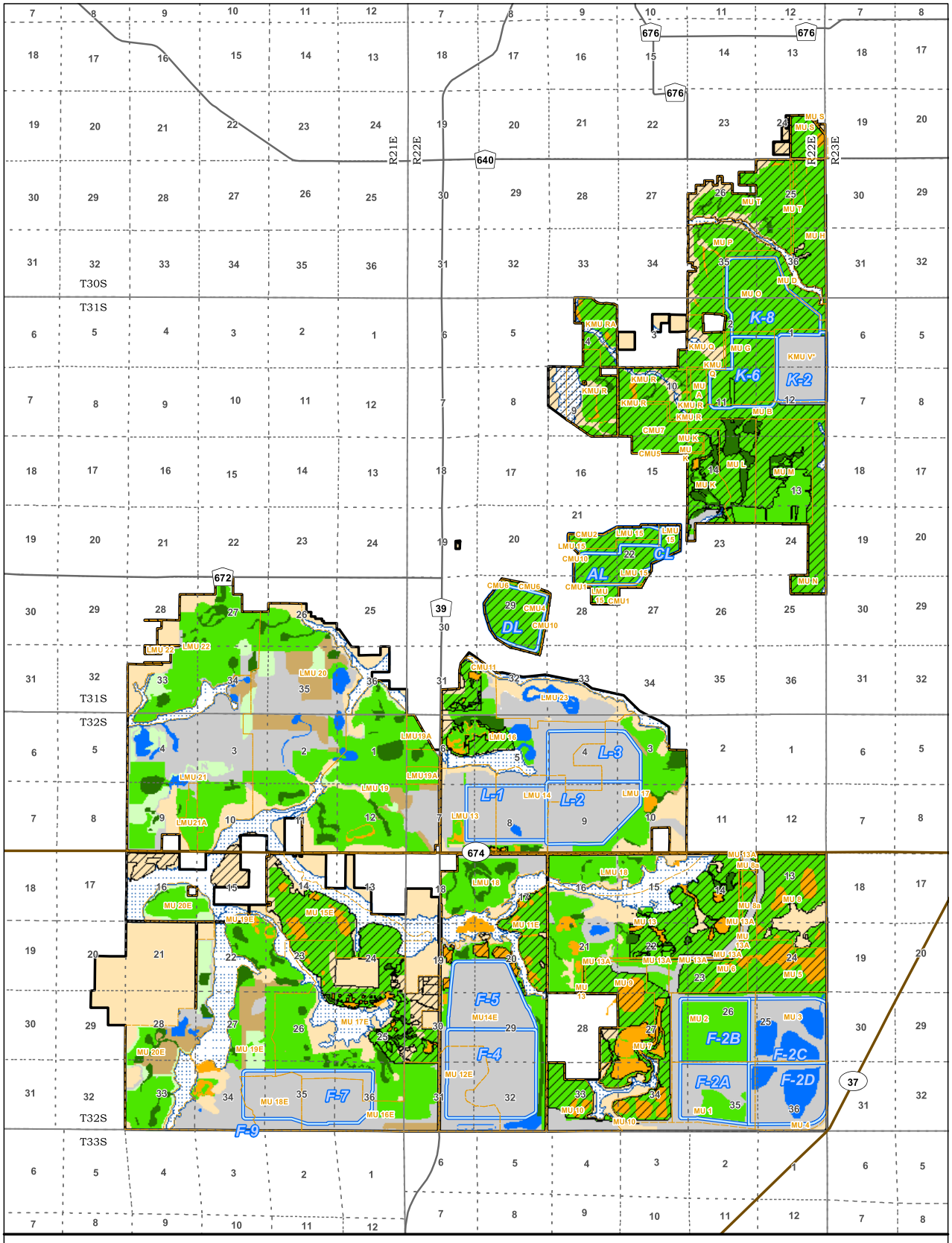
*KMU V was never approved by the County and was not mined after 1975

HILLSBOROUGH COUNTY MINES

MAP 6A
FDEP RECLAMATION STATUS
AND EPC MITIGATION STATUS

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

User: jlb Date: 8/13/2025
Path: G:\projects\2025\2025_0094\maps\map6a-recstat-basemap.mxd



Legend

- State Roads
- County Roads
- Township / Range Lines
- Section Lines
- Mining Unit Boundaries
- DRI Boundary
- Clay Settling Areas
- Released by FDEP
- EPC Mitigation Constructed, Released by EPC
- EPC Mitigation Constructed, Not Released (As-Built Received and/or Monitored)
- Not Planned for Disturbance
- EPC Mitigation, not Constructed
- Reclamation Complete and in One Year Establishment
- Reclamation Complete Beyond One Year Establishment
- Reclamation Work in Progress (Contoured)
- Areas Mined or Disturbed and Not Reclaimed
- DRI 263 Tract-Area not Mined

N W E S

0 6,000 Feet

Mosaic

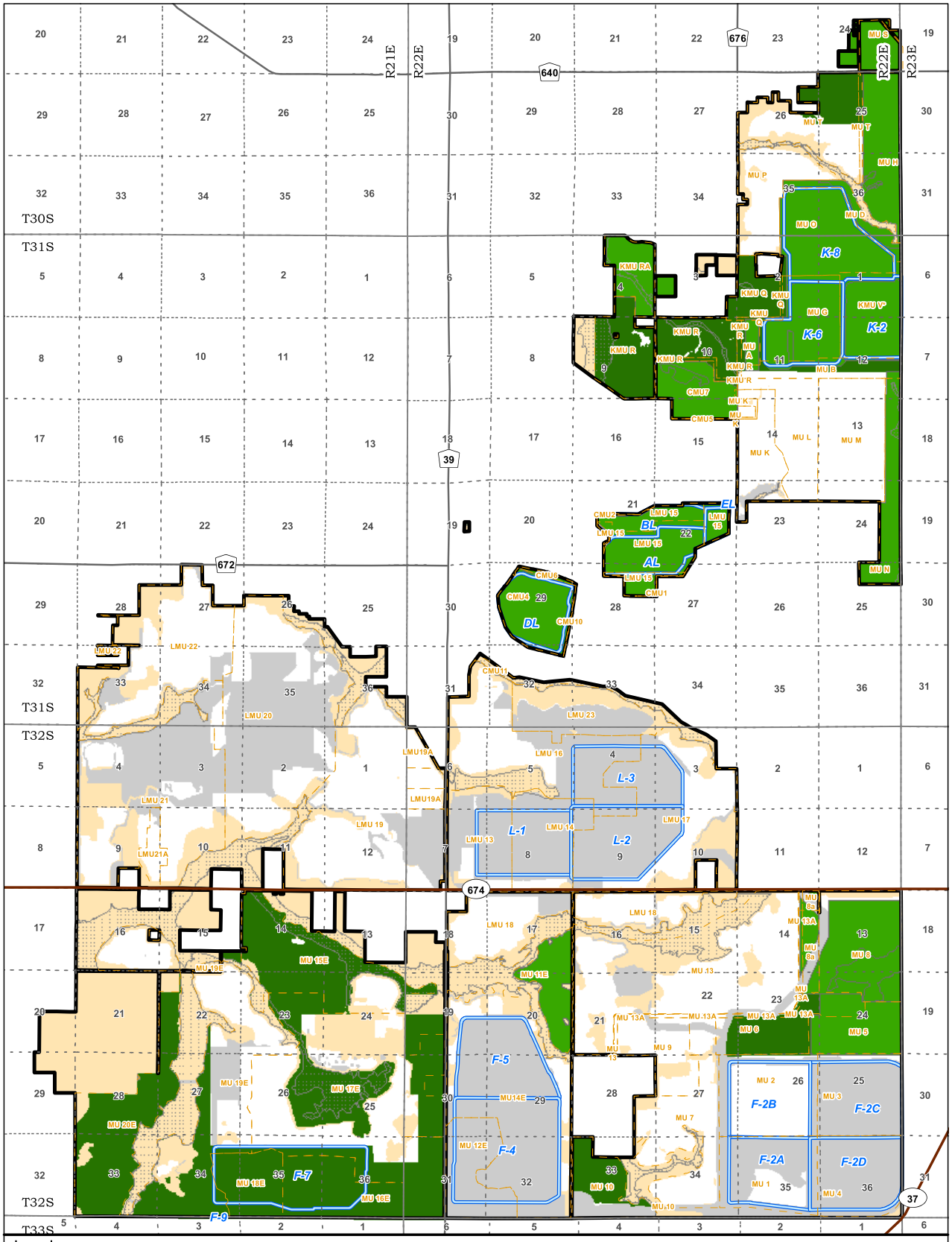
HILLSBOROUGH COUNTY MINES

MAP 6B
FDEP RECLAMATION STATUS
AND EPC MITIGATION STATUS

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

*KMU V was never approved by the County and was not mined after 1975

User: jlb Date: 8/13/2025
Path: G:\projects\2025\2025_0094\maps\map6b-recstat-basemap.mxd



Legend

- State Roads
- County Roads
- Township / Range Lines
- DRI Boundary
- Section Lines
- Clay Settling Areas
- Mining Unit Boundaries
- Not Planned for Disturbance
- Release by Hillsborough County in Process
- Released by Hillsborough County
- Approval Not Needed
- Areas Mined or Disturbed and Not Reclaimed
- DRI 263 Tract-Area not Mined

*KMU V was never approved by the County and was not mined after 1975

N
W E
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0 6,000
Feet

Mosaic

HILLSBOROUGH COUNTY MINES

MAP 7
HILLSBOROUGH COUNTY
APPROVED RECLAMATION/RELEASES

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

User: jlb Date: 8/13/2025
Path: G:\projects\2025\2025_0094\maps\map7-hco-release.mxd

SECTION 5
RECLAMATION RELEASE STATUS

THE MOSAIC COMPANY

DRI 263 CONSOLIDATED MINES ANNUAL REPORT
HILLSBOROUGH COUNTY
RECLAMATION RELEASE STATUS TO JUNE 30, 2025

(FOR THE REPORT PERIOD OF JULY 1, 2024 THROUGH JUNE 30, 2025)

Mosaic is listing Logical Reclamation Units (LRUs) (also known as Reclamation Parcels (RP)) that have been formally released by Hillsborough County Development Services. These reclamation releases total 6,809.3 acres of previously mined and/or disturbed land at DRI 263 Consolidated Mines. Hillsborough County and Mosaic are working to clarify the location and amount of acreage identified as released by Hillsborough County identified in this AR. All of these areas reside within a mining unit (MU) boundary, have been released from FDEP, and certificates of completion have been issued by EPC; with the exception of the preservation, non-disturbed (ND), and non-mandatory (NM) areas which are not required to be released by FDEP. The 2020-2021 Annual Reports included 1,213.3 acres located in the Old DRI 213 boundary in the grand total of released acres. Mosaic will no longer include these acres in the release totals as these lands are no longer Mosaic holdings and are included in the Alafia State Park. Table 1 below lists the MUs and associated acreages that have been agreed upon by Hillsborough County and Mosaic as released. Table 2 reflects the same information listed by LRUs. The attached Hillsborough County Release Maps depicts the information provided in the Tables 1 and 2 below.

Table 1

Mining Unit	Total Acres	Released Acres	Unreleased Acres	Final Release Date
*	173.5	1.0	172.6	2005
CMU 1	0.1	0.1	0.0	Prior to 2005
CMU 10	2.8	2.8	0.0	Prior to 2005
CMU 4	462.9	462.9	0.0	Prior to 2005
CMU 5	0.3	0.3	0.0	Prior to 2005
CMU 6	20.2	20.2	0.0	Prior to 2005
CMU 7	367.6	367.6	0.0	Prior to 2005
F6/8a	0.4		0.4	
KMU Q	257.1	7.0	250.1	2020-06-09
KMU R	872.2	0.3	871.9	
KMU RA	287.3	287.0	0.3	2020-06-09
KMU V	504.5	504.5	0.0	
LMU 13	641.8		641.8	
LMU 14	627.1		627.1	
LMU 15	762.2	762.2	0.0	
LMU 16	1,431.8		1,431.8	
LMU 17	1,847.7		1,847.7	
LMU 18	1,055.2		1,055.2	

Table 1 Continued

Mining Unit	Total Acres	Released Acres	Unreleased Acres	Final Release Date
LMU 19	2,065.4		2,065.4	
LMU 20	2,213.0		2,213.0	
LMU 21	2,052.9		2,052.9	
LMU 22	1,438.4		1,438.4	
LMU 23	623.2		623.2	
LMU19A	156.0		156.0	
LMU21A	121.6		121.6	
MU 1	700.6		700.6	
MU 10	395.8		395.8	
MU 11E	373.2	373.2	0.0	2020-06-09
MU 12E	520.4		520.4	
MU 13	2,157.5		2,157.5	
MU 13A	139.2	26.0	113.2	2021-02-09
MU 14E	1,988.6		1,988.6	
MU 15E	1,055.2		1,055.2	
MU 16E	910.4		910.4	
MU 17E	2,499.8		2,499.8	
MU 18E	399.9		399.9	
MU 19E	1,587.1		1,587.1	
MU 2	780.6		780.6	
MU 20E	1,290.3		1,290.3	
MU 3	667.7		667.7	
MU 4	645.5		645.5	
MU 5	387.7	381.5	6.2	
MU 6	475.0	102.6	372.4	
MU 7	894.5		894.5	
MU 8	843.4	737.5	106.0	2021-02-09
MU 8a	161.1	101.9	59.2	2021-02-09
MU 9	464.9		464.9	
MU A	79.6	58.1	21.5	2020-06-09
MU B	283.5	75.7	207.8	2020-06-09
MU D	148.0	148.0	0.0	2020-06-09
MU G	557.7	526.7	31.0	2020-06-09
MU H	544.0	543.3	0.7	2020-06-09
MU K	464.7	3.3	461.4	2005
MU L	499.4		499.4	
MU M	795.2		795.2	
MU N	398.3	398.3	0.0	2020-06-09

Table 1 Continued

Mining Unit	Total Acres	Released Acres	Unreleased Acres	Final Release Date
MU O	734.6	725.5	9.1	
MU P	562.8		562.8	
MU S	188.0	188.0	0.0	2020-06-09
MU T	743.8	3.8	740.0	2020-06-09
Grand Total	**43,323.2**	**6,809.3**	**36,514.1**	
Total Released Acres		**6,809.3**		

Completely Released MU

* Outside MU boundary no release required

Table 2

BOUNDARY	STATUS	LRUID	MUID	Uplands	Water	Wetlands (F)	Wetlands (H)	Grand Total
DRI 263	No Approval Needed	IMC-K-H	KMU V	448.3				448.3
		IMC-K-H Total		448.3				448.3
		No Approval Needed Total		**448.3**				**448.3**
	Released by Hillsborough County	BP-L-SP(2A)	*	0.1				0.1
			CMU5	0.3				0.3
			CMU7	323.8		43.8		367.6
			KMU R	0.2		0.1		0.3
			MU K	3.2				3.2
		BP-L-SP(2A) Total		327.6		43.9		371.5
		BP-L-SP(8)	CMU10	2.0		0.3		2.3
			CMU4	402.6	26.3	34.0		462.9
			CMU6	14.9	0.9	3.8	0.6	20.2
		BP-L-SP(8) Total		419.5	27.2	38.1	0.6	485.4
		IMC-FCL-AC(6)	*	0.3				0.3
			MU 11E	302.8		7.3	53.4	363.5
		IMC-FCL-AC(6) Total		303.1		7.3	53.4	363.8
		IMC-FCL-PC(1A)	MU 5	273.1			108.4	381.5
			MU 6	46.0		10.8	45.9	102.7
			MU 8	3.0				3.0
		IMC-FCL-PC(1A) Total		322.1		10.8	154.3	487.2
		IMC-FCL-PC(3)	MU 13A	25.5			0.5	26.0
			MU 6					
			MU 8	452.5		6.8	94.6	553.9
			MU 8a	93.7		0.6	7.6	101.9
		IMC-FCL-PC(3) Total		571.7		7.4	102.7	681.8

Table 2 Continued

BOUNDARY	STATUS	LRUID	MUID	Uplands	Water	Wetlands (F)	Wetlands (H)	Grand Total
DRI 263	Released by Hillsborough County	IMC-K-10	KMU Q	1.6				1.6
			MU A	45.2	5.7	7.2		58.1
			MU B	6.9				6.9
		IMC-K-10 Total		53.7	5.7	7.2		66.6
		IMC-KC-BOG(2)	KMU Q	5.4				5.4
			KMU V	15.6				15.6
			MU B	44.3				44.3
			MU G	474.9				474.9
		IMC-KC-BOG(2) Total		540.2				540.2
		IMC-KC-BOG(5)	*			0.5		0.5
			CMU1			0.1		0.1
			CMU10	0.6				0.6
			CMU2					
			LMU 15	721.4	15.1	8.1	17.6	762.2
		IMC-KC-BOG(5) Total		722.0	15.1	8.7	17.6	763.4
		IMC-KC-LB(6)	MU B	10.0			1.6	11.6
			MU N	297.2	9.3	84.9	6.9	398.3
		IMC-KC-LB(6) Total		307.2	9.3	84.9	8.5	409.9
		IMC-KC-MC(1A)	KMU V	40.6				40.6
			MU D	59.1		1.5		60.6
			MU G	37.7				37.7
			MU O	725.5				725.5
		IMC-KC-MC(1A) Total		862.9		1.5		864.4
		IMC-KC-SPA(13)	KMU R					
			KMU RA	196.2	20.4	22.5	47.9	287.0
		IMC-KC-SPA(13) Total		196.2	20.4	22.5	47.9	287.0
		IMC-KC-TMC(1)	MU S	77.6	61.1	20.2	29.1	188.0
		IMC-KC-TMC(1) Total		77.6	61.1	20.2	29.1	188.0
		IMC-K-H	MU B	11.3				11.3
		IMC-K-H Total		11.3				11.3
		IMC-K-J	MU B	1.5				1.5
			MU G	14.1				14.1
		IMC-K-J Total		15.6				15.6
		IMC-K-MC(2A)	MU D	0.1				0.1
			MU H	451.0	14.6	29.9	33.8	529.3
			MU T	3.8		0.1		3.9
		IMC-K-MC(2A) Total		454.9	14.6	30.0	33.8	533.3

Table 2 Continued

BOUNDARY	STATUS	LRUID	MUID	Uplands	Water	Wetlands (F)	Wetlands (H)	Grand Total
DRI 263	Released by Hillsborough County	IMC-K-MC(3)	MU D	73.7	1.7	7.5	4.4	87.3
			MU H					
		IMC-K-MC(3) Total		73.7	1.7	7.5	4.4	87.3
		ND	MU 11E	1.0		8.5	0.2	9.7
			MU 8	20.3	4.7	69.8	85.8	180.6
			MU H	14.0				14.0
		ND Total		35.3	4.7	78.3	86.0	204.3
	Released by Hillsborough County Total			**5,294.6**	**159.8**	**368.3**	**538.3**	**6,361.0**
DRI 263 Total				**5,742.9**	**159.8**	**368.3**	**538.3**	**6,809.3**

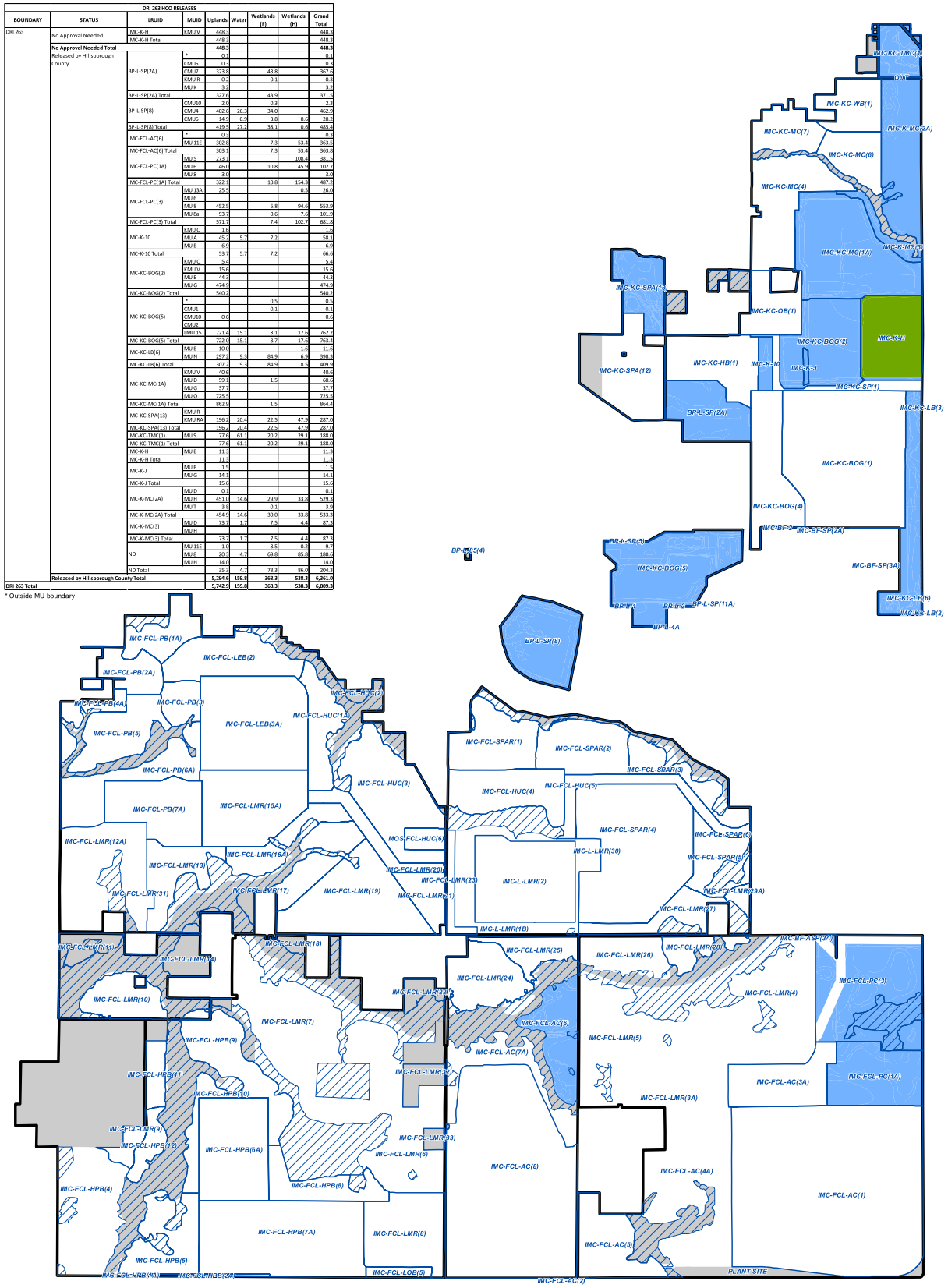
*Acreage falls within an LRU boundary but not within a MU boundary

Mosaic requests reclamation releases outside of the annual report twice a year in the Spring and the Fall. The spring 2021 release request for 2,915.8 acres in LRUs IMC-FCL-AC(3A), IMC-FCL-AC(5), IMC-FCL-LMR(7), IMC-KC-HB(1), IMC-KC-WB(1) was submitted to Hillsborough County on March 24, 2021. Of the 2915.8 acres requested, 2671.7 acres were granted approval and are pending release. The remaining 244.1 acres are under review and release is not yet granted. Once approved by the Hillsborough County Board of County Commissioners (BOCC), these releases will be recorded in the Annual Reports.

DRI 263 HCO RELEASES

BOUNDARY	STATUS	LRUID	MUID	Uplands	Water	Wetlands (F)	Wetlands (H)	Grand Total
DRI 263	No Approval Needed	IMC-K-H	KMU V	448.3				448.3
		IMC-K-H Total		448.3				448.3
	No Approval Needed Total			**448.3**				**448.3**
	Released by Hillsborough County	BP-L-SP(2A)	*	0.1				0.1
			CMU5	0.3				0.3
			CMU7	323.8		43.8		367.6
			KMU B	0.2		0.1		0.3
			MU K	3.2				3.2
		BP-L-SP(2A) Total		327.6		43.9		371.5
		BP-L-SP(8)	CMU10	2.0		0.3		2.3
			CMU4	402.6	26.3	34.0		462.9
			CMU6	14.9	0.9	3.8	0.8	20.2
		BP-L-SP(8) Total		419.5	27.2	38.1	0.8	485.4
		IMC-FCL-AC(6)	*	0.3				0.3
			MU 11E	302.8		7.3	53.4	363.5
		IMC-FCL-AC(6) Total		303.1		7.3	53.4	363.8
		IMC-FCL-PC(1A)	MU 5	273.1			108.4	381.5
			MU 6	46.0		10.8	45.9	102.7
			MU 8	3.0				3.0
		IMC-FCL-PC(1A) Total		322.1		10.8	154.3	487.2
		IMC-FCL-PC(3)	MU 13A	25.5			0.5	26.0
			MU 6					
			MU 8	452.5		6.8	94.8	553.9
			MU 8a	93.7		0.8	7.6	101.9
		IMC-FCL-PC(3) Total		571.7		7.4	102.7	681.8
		IMC-K-10	KMU Q	1.6				1.6
			MU A	45.2	5.7	7.2		58.1
			MU B	6.9				6.9
		IMC-K-10 Total		53.7	5.7	7.2		66.6
		IMC-KC-BOG(2)	KMU Q	5.4				5.4
			KMU V	15.6				15.6
			MU B	44.3				44.3
			MU G	474.9				474.9
		IMC-KC-BOG(2) Total		540.2				540.2
		IMC-KC-BOG(5)	*			0.3		0.3
			CMU1			0.3		0.3
			CMU10	0.6				0.6
			CMU2					
			LMU 15	721.4	15.1	8.1	17.6	762.2
		IMC-KC-BOG(5) Total		722.0	15.1	8.7	17.6	763.4
		IMC-KC-LB(6)	MU B	10.0			1.4	11.4
			MU N	297.2	9.3	84.9	6.9	398.3
		IMC-KC-LB(6) Total		307.2	9.3	84.9	8.5	409.9
		IMC-KC-MC(1A)	KMU V	40.6				40.6
			MU D	59.1		1.5		60.6
			MU G	37.7				37.7
			MU O	725.5				725.5
		IMC-KC-MC(1A) Total		862.9		1.5		864.4
		IMC-KC-SPA(13)	KMU R					
			KMU RA	196.2	20.4	22.5	47.9	287.0
		IMC-KC-SPA(13) Total		196.2	20.4	22.5	47.9	287.0
		IMC-KC-TMC(1)	MU S	77.6	61.1	20.2	29.1	188.0
		IMC-KC-TMC(1) Total		77.6	61.1	20.2	29.1	188.0
		IMC-K-H	MU B	11.3				11.3
		IMC-K-H Total		11.3				11.3
		IMC-K-J	MU B	1.5				1.5
			MU G	14.1				14.1
		IMC-K-J Total		15.6				15.6
		IMC-K-MC(2A)	MU D	0.1				0.1
			MU H	451.0	14.6	29.9	33.8	529.3
			MU T	3.8		0.1		3.9
		IMC-K-MC(2A) Total		454.9	14.6	30.0	33.8	533.3
		IMC-K-MC(3)	MU D	73.7	1.7	7.5	4.4	87.3
			MU H					
		IMC-K-MC(3) Total		73.7	1.7	7.5	4.4	87.3
		ND	MU 11E	1.0		8.5	0.2	9.7
			MU 8	20.3	4.7	69.8	85.8	180.6
			MU H	14.0				14.0
		ND Total		35.3	4.7	78.3	86.0	204.3
	Released by Hillsborough County Total			**5,294.6**	**159.8**	**368.3**	**538.3**	**6,361.0**
DRI 263 Total				**5,742.9**	**159.8**	**368.3**	**538.3**	**6,809.3**

* Outside MU boundary



Legend

- LRU Boundaries
- Non-Disturbed
- DRI 263 Boundary
- No Approval Needed
- Released by Hillsborough County
- Outside of Mining Unit Boundaries

N

0 6,000 Feet

Mosaic

HILLSBOROUGH COUNTY MINES

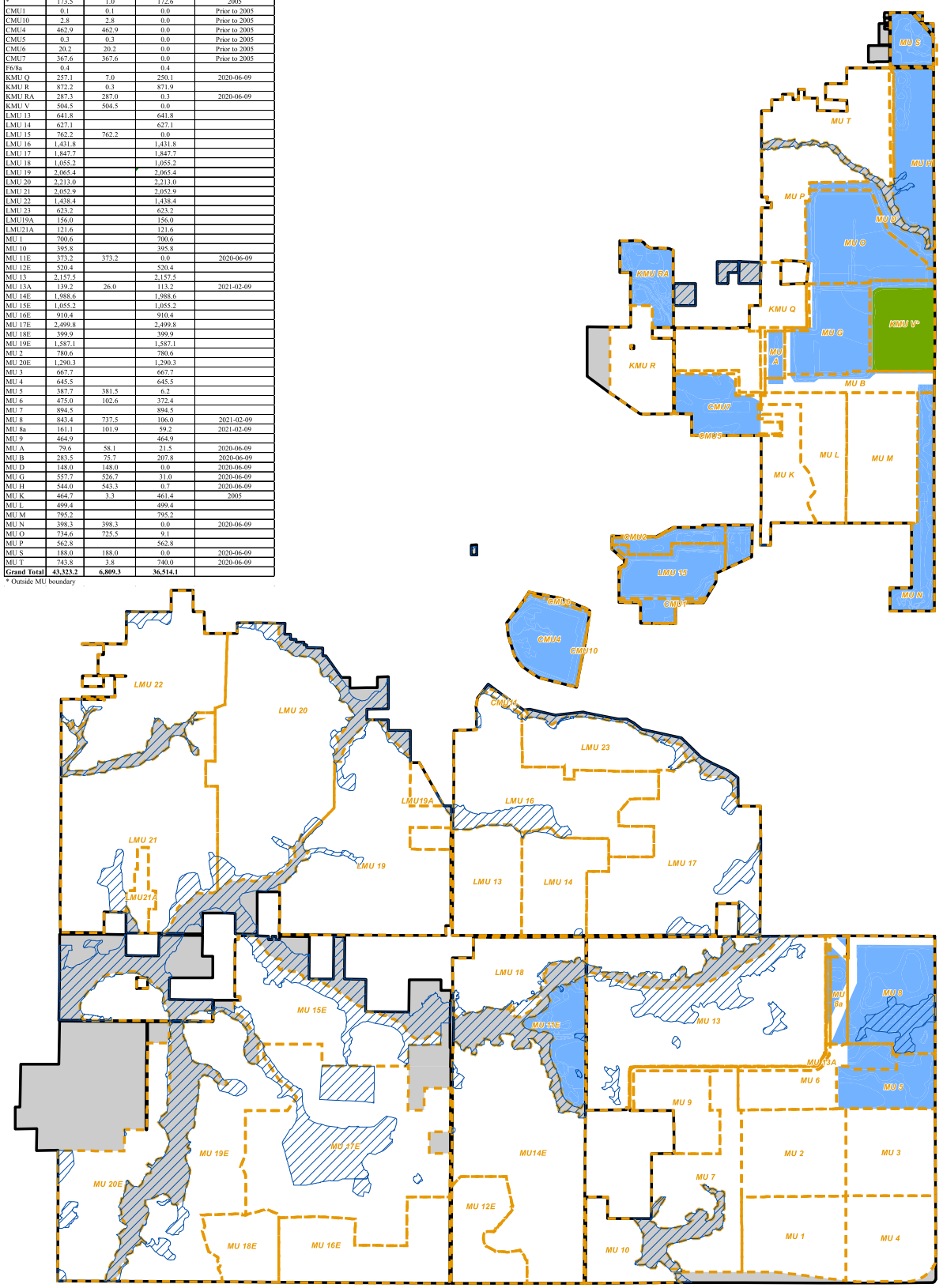
HCO APPROVALS
LRU Boundaries

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

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Mining Unit	Total Acres	Released Acres	Unreleased Acres	Final Release Date
*	173.5	1.0	172.6	2005
CMU1	0.1	0.1	0.0	Prior to 2005
CMU10	2.8	2.8	0.0	Prior to 2005
CMU4	462.9	462.9	0.0	Prior to 2005
CMU5	0.3	0.3	0.0	Prior to 2005
CMU6	20.2	20.2	0.0	Prior to 2005
CMU7	367.6	367.6	0.0	Prior to 2005
F6/8a	0.4		0.4	
KMU Q	257.1	7.0	250.1	2020-06-09
KMU R	872.2	0.3	871.9	
KMU RA	287.3	287.0	0.3	2020-06-09
KMU V	504.5	504.5	0.0	
LMU 13	641.8		641.8	
LMU 14	627.1		627.1	
LMU 15	762.2	762.2	0.0	
LMU 16	1,431.8		1,431.8	
LMU 17	1,847.7		1,847.7	
LMU 18	1,055.2		1,055.2	
LMU 19	2,065.4		2,065.4	
LMU 20	2,213.0		2,213.0	
LMU 21	2,052.9		2,052.9	
LMU 22	1,438.4		1,438.4	
LMU 23	623.2		623.2	
LMU19A	156.0		156.0	
LMU21A	121.6		121.6	
MU 1	700.6		700.6	
MU 10	395.8		395.8	
MU 11E	373.2	373.2	0.0	2020-06-09
MU 12E	520.4		520.4	
MU 13	2,157.5		2,157.5	
MU 13A	139.2	26.0	113.2	2021-02-09
MU 14E	1,988.6		1,988.6	
MU 15E	1,055.2		1,055.2	
MU 16E	910.4		910.4	
MU 17E	2,499.8		2,499.8	
MU 18E	399.9		399.9	
MU 19E	1,587.1		1,587.1	
MU 2	780.6		780.6	
MU 20E	1,290.3		1,290.3	
MU 3	667.7		667.7	
MU 4	645.5		645.5	
MU 5	387.7	381.5	6.2	
MU 6	475.0	102.6	372.4	
MU 7	894.5		894.5	
MU 8	843.4	737.5	106.0	2021-02-09
MU 8a	161.1	101.9	59.2	2021-02-09
MU 9	464.9		464.9	
MU A	79.6	58.1	21.5	2020-06-09
MU B	283.5	75.7	207.8	2020-06-09
MU D	148.0	148.0	0.0	2020-06-09
MU G	557.7	526.7	31.0	2020-06-09
MU H	544.0	543.3	0.7	2020-06-09
MU K	464.7	3.3	461.4	2005
MU L	499.4		499.4	
MU M	795.2		795.2	
MU N	398.3	398.3	0.0	2020-06-09
MU O	734.6	725.5	9.1	
MU P	562.8		562.8	
MU S	188.0	188.0	0.0	2020-06-09
MU T	743.8	3.8	740.0	2020-06-09
Grand Total	**43,323.2**	**6,809.3**	**36,514.1**	

* Outside MU boundary



Legend

- Non-Disturbed
- Mining Unit Boundaries
- DRI 263 Boundary
- No Approval Needed
- Released by Hillsborough County
- Outside of Mining Unit Boundaries

N

0 6,000 Feet

* KMU V was never approved by the County and was not mined after 1975

Mosaic

HILLSBOROUGH COUNTY MINES

HCO APPROVALS
Mining Unit Boundaries

2024/2025 ANNUAL REPORT
HILLSBOROUGH COUNTY

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