2025-2035

SUWANNEE RIDGE WILDLIFE AND ENVIRONMENTAL AREA

10-YEAR MANAGEMENT PLAN

HAMILTON COUNTY



FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

620 SOUTH MERIDIAN STREET

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PENDING APPROVAL LETTER

Suwannee Ridge Wildlife and Environmental Area Management Plan

Hamilton County

Owned by the Board of Trustees of the Internal Improvement Trust Fund
Managed by the Florida Fish and Wildlife Conservation Commission

August 2025

Approved Melissa Tucker Digitally signed by Melissa Tucker Date: 2025.08.06 11:40:26 -04'00'

Melissa Tucker, Director
Division of Habitat and Species Conservation

LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

Lead Agency: Florida Fish and Wildlife Conservation Commission (FWC)
Common Name of Property: Suwannee Ridge Wildlife and Environmental Area
Location: Hamilton County, Florida
Acreage Total: 1,429 acres
Acreage Breakdown:

Land Cover Classification	Acres*	Percent of Total Area
Basin Marsh	1.37	0.1%
Depression Marsh	13.64	0.9%
Dome Swamp	14.40	1.0%
Road	81.11	5.6%
Sandhill	1,058.69	73.6%
Sinkhole	16.89	1.2%
Successional Hardwood Forest	12.49	0.9%
Upland Hardwood Forest	16.84	1.2%
Upland Mixed Woodland	103.59	7.2%
Upland Pine	103.66	7.2%
Wet Flatwoods	15.53	1.1%

*GIS-calculated acreage for land cover classification varies slightly from actual total acreage.
Lease/Management Agreement No.: 4405
Use: Single ___ Multiple X
Management Responsibilities: Agency FWC
Responsibilities: LEAD, LESSEE (Wildlife and Environmental Area, resource protection, law enforcement)
Designated Land Use: Wildlife and Environmental Area
Sublease (s): None
Encumbrances: One access easement
Type Acquisition: Gopher Tortoise Mitigation Park
Unique Features: Natural communities include basin marsh, depression marsh, dome swamp, sandhill, upland hardwood forest, upland mixed woodland, upland pine, and wet flatwoods
Archaeological/Historical: 11 documented within the SRWEA
Management Needs: Habitat restoration and improvement; public access and recreational opportunities; hydrological preservation and restoration; invasive species maintenance and control; imperiled species habitat maintenance, enhancement, and restoration
Acquisition Needs/Acreage: 4,350 acres FWC Additions and Inholdings list (Figure13)
Surplus Lands/Acreage: None
Public Involvement: Management Advisory Group consensus building meeting and Public Hearing (Appendix 11.3)

DO NOT WRITE BELOW THIS LINE (FOR DIVISION OF STATE LANDS USE ONLY)

ARC Approval Date _____ BTIITF Approval Date: _____
Comments: _____

Land Management Plan Compliance Checklist

Required for State-owned conservation lands over 160 acres

Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1	The common name of the property.	18-2.018 & 18-2.021	1
2	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	9, 10, Appendix 11.1
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	9, 10, Appendix 11.1
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	2, Appendix 11.1
5	A map showing the approximate location and boundaries of the property, and the location of any structures or improvements to the property.	18-2.018 & 18-2.021	27
6	An assessment as to whether the property, or any portion, should be declared surplus. *Provide Information regarding assessment and analysis in the plan, and provide corresponding map.*	18-2.021	30
7	Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property. *Please clearly indicate parcels on a map.*	18-2.021	46-49
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	28
9	A statement of the purpose for which the lands were acquired, the projected use or uses as defined in 253.034 and the statutory authority for such use or uses.	259.032(10)	9, 10
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	2, 3, 7

Section B: Use Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
11	The designated single use or multiple use management for the property, including use by other managing entities.	18-2.018 & 18-2.021	29, 30
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	24
13	A description of alternative or multiple uses of the property considered by the lessee and a statement detailing why such uses were not adopted.	18-2.018	29, 30
14	A description of the management responsibilities of each entity involved in the property's management and how such responsibilities will be coordinated.	18-2.018	9, Appendix 11.1
15	Include a provision that requires that the managing agency consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archeological or historical resources.	18-2.021	23, 24, 43, 53, Appendix 11.17
16	Analysis/description of other managing agencies and private land managers, if any, which could facilitate the restoration or management of the land.	18-2.021	50, 54, 55, 59
17	A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	259.032(10)	29, 30

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
18	A finding regarding whether each planned use complies with the 1981 State Lands Management Plan, particularly whether such uses represent "balanced public utilization," specific agency statutory authority and any other legislative or executive directives that constrain the use of such property.	18-2.021	29, 30, 31
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	Appendix 11.21
20	An assessment of the impact of planned uses on the renewable and non-renewable resources of the property, including soil and water resources, and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to compensate/mitigate damage caused by such uses, including a description of how the manager plans to control and prevent soil erosion and soil or water contamination.	18-2.018 & 18-2.021	11, 21, 31, 32, 42, 53
21	*For managed areas larger than 1,000 acres, an analysis of the multiple-use potential of the property which shall include the potential of the property to generate revenues to enhance the management of the property provided that no lease, easement, or license for such revenue-generating use shall be entered into if the granting of such lease, easement or license would adversely affect the tax exemption of the interest on any revenue bonds issued to fund the acquisition of the affected lands from gross income for federal income tax purposes, pursuant to Internal Revenue Service regulations.	18-2.021 & 253.036	29, 30, 56-58
22	If the lead managing agency determines that timber resource management is not in conflict with the primary management objectives of the managed area, a component or section, prepared by a qualified professional forester, that assesses the feasibility of managing timber resources pursuant to section 253.036, F.S.	18-021	23, 42, 53
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	30

*The following taken from 253.034(10) is not a land management plan requirement; however, it should be considered when developing a land management plan: The following additional uses of conservation lands acquired pursuant to the Florida Forever program and other state-funded conservation land purchase programs shall be authorized, upon a finding by the Board of Trustees, if they meet the criteria specified in paragraphs (a)-(e): water resource development projects, water supply development projects, storm-water management projects, linear facilities and sustainable agriculture and forestry. Such additional uses are authorized where: (a) Not inconsistent with the management plan for such lands; (b) Compatible with the natural ecosystem and resource values of such lands; (c) The proposed use is appropriately located on such lands and where due consideration is given to the use of other available lands; (d) The using entity reasonably compensates the titleholder for such use based upon an appropriate measure of value; and (e) The use is consistent with the public interest.

Section C: Public Involvement Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
24	A statement concerning the extent of public involvement and local government participation in the development of the plan, if any.	18-2.021	10
25	The management prospectus required pursuant to paragraph (9)(d) shall be available to the public for a period of 30 days prior to the public hearing.	259.032(10)	10, Appendices 11.2, 11.3
26	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. *Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.*	259.032(10)	Appendix 11.3.1
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	Appendix 11.3.1
28	During plan development, at least one public hearing shall be held in each affected county. Notice of such public hearing shall	253.034(5) & 259.032(10)	Appendix 11.2

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
	be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. *Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.*		
29	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. *Include manager's replies to the team's findings and recommendations.*	259.036	Appendix 11.3.2
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	Appendix 11.3
31	If manager is not in agreement with the management review team's findings and recommendations in finalizing the required 10-year update of its management plan, the managing agency should explain why they disagree with the findings or recommendations.	259.036	Appendix 11.3

Section D: Natural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
32	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding soil types. *Use brief descriptions and include USDA maps when available.*	18-2.021	11-13, Appendix 11.8
33	Insert FNAI based natural community maps when available.	ARC consensus	15, 16
34	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding outstanding native landscapes containing relatively unaltered flora, fauna and geological conditions.	18-2.021	11, 14-20, 23
35	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding unique natural features and/or resources including but not limited to virgin timber stands, scenic vistas, natural rivers and streams, coral reefs, natural springs, caverns and large sinkholes.	18-2.018 & 18-2.021	21-24
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	23
37	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding mineral resources, such as oil, gas and phosphate, etc.	18-2.018 & 18-2.021	23
38	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding fish and wildlife, both game and non-game, and their habitat.	18-2.018 & 18-2.021	25, 36-38
39	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding State and Federally listed endangered or threatened species and their habitat.	18-2.021	17, 19-21
40	The identification or resources on the property that are listed in the Natural Areas Inventory. *Include letter from FNAI or consultant where appropriate.*	18-2.021	17, 19-21, Appendices 11.5, 11.7, 11.11
41	Specific description of how the managing agency plans to identify, locate, protect and preserve or otherwise use fragile, nonrenewable natural and cultural resources.	259.032(10)	51-55
42	**Habitat Restoration and Improvement**	259.032(10) & 253.034(5)	

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
42-A.	Describe management needs, problems and a desired outcome and the key management activities necessary to achieve the enhancement, protection and preservation of restored habitats and enhance the natural, historical, and archeological resources and their values for which the lands were acquired.	↓	11-24, 34-36, 51, 55
42-B.	Provide a detailed description of both short (2-year planning period) and long-term (10-year planning period) management goals, and a priority schedule based on the purposes for which the lands were acquired and include a timeline for completion.	↓	51
42-C.	The associated measurable objectives to achieve the goals.	↓	51, 55
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. *Include fire management plans - they can be in plan body or an appendix*.	↓	34-36, Appendices 11.7 and 11.13
42-E.	A detailed expense and manpower budget in order to provide a management tool that facilitates development of performance measures, including recommendations for cost-effective methods of accomplishing those activities.		56-58
43	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. *See footnote.*	253.034(5)	Appendix 11.5
44	**Sustainable Forest Management, including implementation of prescribed fire management**	18-2.021, 253.034(5) & 259.032(10) ↓	
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	23, 35, 42, 43, 53, 55, Appendices 11.13, 11.15
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	53
44-C.	Measurable objectives (see requirement for #42-C).	↓	53
44-D.	Related activities (see requirement for #42-D).	↓	23, 35, 42,43, 55
44-E.	Budgets (see requirement for #42-E).		56-58
45	**Imperiled species, habitat maintenance, enhancement, restoration, or population restoration**	259.032(10) & 253.034(5)	
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	17, 19, 38, 51, 55
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	51
45-C.	Measurable objectives (see requirement for #42-C).	↓	51
45-D.	Related activities (see requirement for #42-D).	↓	17, 19, 38, 55
45-E.	Budgets (see requirement for #42-E).		56-58
45-F	Assess the feasibility of managing the lands > 40 contiguous acres as a recipient site for gopher tortoises consistent with rules of the Fish and Wildlife Conservation Commission, as prepared by the agency or cooperatively with a Fish and Wildlife Conservation Commission wildlife biologist.	259.105	19
45-G	Economic feasibility of establishing a gopher tortoise recipient site, including the initial cost, recurring management costs and the revenue projections.	259.105	19
46	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. *See footnote.*	253.034(5)	18, Appendix 11.5
47	Place the Arthropod Control Plan in an appendix. If one does not exist, provide a statement as to what arrangement exists between the local mosquito control district and the management unit.	BOT requirement via lease language	Appendix 11.20

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
48	**Exotic and invasive species maintenance and control**	259.032(10) & 253.034(5)	
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	18-20, 38-40, 52, 55
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	52
48-C.	Measurable objectives (see requirement for #42-C).	↓	52
48-D.	Related activities (see requirement for #42-D).	↓	18-20, 38-40, 55
48-E.	Budgets (see requirement for #42-E).		56-58

Section E: Water Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
49	A statement as to whether the property is within and/or adjacent to an aquatic preserve or a designated area of critical state concern or an area under study for such designation. *If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.*	18-2.018 & 18-2.021	21, 22
50	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding water resources, including water classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Water under Rule 62-302.700, F.A.C.	18-2.021	21, 22
51	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding swamps, marshes and other wetlands.	18-2.021	14-16, Appendices 11.5, 11.16
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. *See footnote.*	253.034(5)	21, 22, Appendices 11.16
53	**Hydrological Preservation and Restoration**	259.032(10) & 253.034(5)	
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	21, 22, 42, 53, 55
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	53
53-C.	Measurable objectives (see requirement for #42-C).	↓	53
53-D.	Related activities (see requirement for #42-D).	↓	21, 22, 42, 55
53-E.	Budgets (see requirement for #42-E).		56-58

Section F: Historical, Archeological and Cultural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
54	**Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding archeological and historical resources. *Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.*	18-2.018, 18-2.021 & per DHR's request	23, 24, 43
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	23, 24, 43

56	A description of actions the agency plans to take to locate and identify unknown resources such as surveys of unknown archeological and historical resources.	18-2.021	23, 24, 43, 53, Appendix 11.17
57	**Cultural and Historical Resources**	259.032(10) & 253.034(5)	
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	23, 24, 43, 53, 55, Appendix 11.17
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	53
57-C.	Measurable objectives (see requirement for #42-C).	↓	53
57-D.	Related activities (see requirement for #42-D).	↓	23, 24, 43, 55, Appendix 11.17
57-E.	Budgets (see requirement for #42-E).		56-58

**While maps of Native American sites should not be included in the body of the management plan, the DSL urges each managing agency to provide such information to the Division of Historical Resources for inclusion in their proprietary database. This information should be available for access to new managers to assist them in developing, implementing and coordinating their management activities.

Section G: Facilities (Infrastructure, Access, Recreation)

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
58	***Quantitative data description of the land regarding an inventory of infrastructure and associated acreage. *See footnote.*	253.034(5)	25, 26, 43, 53-55
59	**Capital Facilities and Infrastructure**	259.032(10) & 253.034(5)	
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	25, 26, 43, 55
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	53, 54
59-C.	Measurable objectives (see requirement for #42-C).	↓	53, 54
59-D.	Related activities (see requirement for #42-D).	↓	25, 26, 43, 55
59-E.	Budgets (see requirement for #42-E).		56-58
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	25, 26, 40-42, 52, 55
61	**Public Access and Recreational Opportunities**	259.032(10) & 253.034(5)	
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	↓	25, 26, 40-42, 55
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	52
61-C.	Measurable objectives (see requirement for #42-C).	↓	52
61-D.	Related activities (see requirement for #42-D).	↓	25, 26, 40-42, 55
61-E.	Budgets (see requirement for #42-E).		56-58

Section H: Other/ Managing Agency Tools

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
62	Place this LMP Compliance Checklist at the front of the plan.	ARC and managing agency consensus	ii-viii
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	i
64	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	30-50
65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	51-55

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
66	Summary budget for the scheduled land management activities of the LMP including any potential fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitat, which fees shall be used to restore, manage, enhance, repopulate, or acquire imperiled species habitat for lands that have or are anticipated to have imperiled species or such habitat onsite. The summary budget shall be prepared in such a manner that it facilitates computing an aggregate of land management costs for all state-managed lands using the categories described in s. 259.037(3) which are resource management, administration, support, capital improvements, recreation visitor services, law enforcement activities.	253.034(5)	56-58, Appendix 11.19
67	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032(10)	56-58, Appendix 11.19
68	A statement of gross income generated, net income and expenses.	18-2.018	28, 29, 56-58, Appendix 11.19

*** = The referenced inventories shall be of such detail that objective measures and benchmarks can be established for each tract of land and monitored during the lifetime of the plan. All quantitative data collected shall be aggregated, standardized, collected, and presented in an electronic format to allow for uniform management reporting and analysis. The information collected by the DEP pursuant to s. 253.0325(2) shall be available to the land manager and his or her assignee.

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Acronym Key

ADA	Americans with Disabilities Act
ARC	Acquisition and Restoration Council
ARM	Archaeological Resource Management
CR	County Road
DEP	Department of Environmental Protection
DFC	Desired Future Conditions
DHR	Division of Historical Resources
DSL	Division of State Lands
F.A.C.	Florida Administrative Code
FDACS	Florida Department of Agriculture and Consumer Services
FFS	Florida Forest Service
FISC	Florida Invasive Species Council
FMSF	Florida Master Site File
FNAI	Florida Natural Areas Inventory
F.S.	Florida Statute(s)
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information Systems
LAP	Landowner Assistance Program
LTDS	Line Transect Distance Sampling
MAG	Management Advisory Group
NRCS	Natural Resources Conservation Service
OBVM	Objective-Based Vegetation Management
SRWEA	Suwannee Ridge Wildlife and Environmental Area
SRWMD	Suwannee River Water Management District
USFWS	United States Fish and Wildlife Service
WCPR	Wildlife Conservation Prioritization and Recovery
WEA	Wildlife and Environmental Area
WMA	Wildlife Management Area

1 Introduction and General Information

Set on the Suwannee Ridge sandhills near Holton Creek, a tributary of the Suwannee River, lies the Suwannee Ridge Wildlife and Environmental Area (SRWEA). The SRWEA conserves and protects important habitat for a keystone sandhill species, the gopher tortoise (*Gopherus polyphemus*), along with many other imperiled, rare, and common sandhill dwelling flora and fauna. Conserving important habitat within a chain of conservation lands that lies along the Suwannee River, the SRWEA provides connectivity within a major wildlife corridor where many species of birds and other wildlife migrate.

Managed by the Florida Fish and Wildlife Conservation Commission (FWC), the SRWEA encompasses 1,429 acres in southern Hamilton County. The SRWEA was established in 2002 and is owned by the Board of Trustees of the Internal Improvement Fund (Board of Trustees). The FWC has lead management authority for all resources within the established boundary (Figures 1 and 2). The SRWEA is managed to conserve and protect natural communities as habitat for an array of native and imperiled species, with emphasis on gopher tortoise populations. It also provides opportunities for wildlife watching and other recreation opportunities, such as hunting for people with mobility impairments, nature study, geocaching, and hiking.

This Management Plan serves as the basic statement of policy and direction for the management of the SRWEA and has been developed to guide each aspect of the SRWEA's resource and operational management for the 10-year planning period. It provides information including past usage, conservation acquisition history, and descriptions of the natural and cultural resources found on the SRWEA. Furthermore, it identifies the FWC's management intent, goals, and objectives, as well as challenges and potential solutions.

This Management Plan is submitted for review to the Acquisition and Restoration Council (ARC) acting on behalf of the Board of Trustees through the Florida Department of Environmental Protection's (DEP) Division of State Lands (DSL), in compliance with Chapters 253 and 259, Florida Statutes (F.S.), and Chapters 18-2 and 18-4, Florida Administrative Code (F.A.C.). Format and content were drafted in accordance with ARC requirements for management plans and the model plan outline provided by the staff of the DSL. Terms (Appendix 11.10) used in this Management Plan describing management activities conform to those developed for the Land Management Uniform Accounting Council Biennial Land Management Operational Report.

The FWC is responsible for the operation of the SRWEA as a Wildlife and Environmental Area (WEA) in addition to several other responsibilities. Further management authority derives from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 372, 373, 375, 378, 379, 403, 487, 597, and 870, F.S. These laws establish the authority of the FWC regarding protection and management of the State's fish and wildlife resources.

1.1 Location

The SRWEA is located within the FWC's North Central Region, in southern Hamilton County, situated between Live Oak, six miles to the south, and Jasper, five miles to the northeast (Figure 1). The northwest boundary of the SRWEA adjoins County Road (CR) 249, which provides direct access to the area. The Suwannee River is located approximately one mile south. Holton Creek Wildlife Management Area (WMA), which is cooperatively managed by the FWC and the Suwannee River Water Management District (SRWMD), forms the southern boundary. Other nearby public lands include the Upper and Lower Alapaha Conservation Areas, Camp Branch Conservation Area, Suwannee River State Park, and Twin Rivers State Forest. The SRWEA is in part of Section 25, Township 1 North, Range 12 East, and part of Sections 29, 30, 31, and 32, Township 1 North, Range 13 East (Figure 3). The SRWEA is not located within a designated Area of Critical State Concern.

1.1.1 Proximity to other Public Conservation Lands

The SRWEA is in the vicinity of an extensive network of conservation lands, including land managed by the SRWMD, the DEP, and Hamilton County. Florida Forever projects are also located in the vicinity (Figure 4).

Tables 1 and 2 list the Florida Forever projects and conservation lands within a 15-mile radius of the SRWEA, including lands managed by public and private entities that conserve cultural and natural resources within this region of Florida.

Most of the conservation lands listed in Table 2 are owned by a public entity. However, some of these areas fall within a less-than-fee ownership classification where the land is owned and managed by a private landowner while a public agency or not-for-profit organization holds a conservation easement on the land.

Table 1. Florida Forever Projects within a 15-mile Vicinity

Project Name	GIS Acres
Strategic Managed Area Lands List	10
Suwannee County Preservation	1,254

Table 2. Conservation Lands within a 15-mile Vicinity

Federal Government	Managing Agency
Adams Tract	USFS
Donaldson Tract	USFS
Goolsby Tract	USFS
Michel Tract	USFS
Richards Tract	USFS
Suwannee River Farms Conservation Easement	USFS
Suwannee River Farms Management Area	USFS
Suwannee River State Park Connector	USFS

State of Florida	Managing Agency
Adams-Alapaha Agricultural and Conservation Easement	FDACS
Madison Blue Spring State Park	DEP
Suwannee River State Park	DEP
Suwannee River Wilderness State Trail	DEP
Twin Rivers State Forest	FDACS

Water Management District	Managing Agency
Camp Branch Conservation Area	SRWMD
Falmouth Conservation Area	SRWMD
Falmouth Spring Conservation Area	SRWMD
Florida Youth Ranches Conservation Easement	SRWMD
Fort Union Conservation Area	SRWMD
Holton Creek Conservation Area	SRWMD
Lower Alapaha Conservation Area	SRWMD
Madison County Conservation Area	SRWMD
Mericle Conservation Easement	SRWMD
Sanders Conservation Easement	SRWMD
Suwannee River State Park Conservation Area	SRWMD
Suwannee Valley Conservation Area	SRWMD
Swift Creek Conservation Area	SRWMD
Upper Alapaha Conservation Area	SRWMD
Upper Alapaha Conservation Easements	SRWMD
Warner/Harrell Conservation Easement	SRWMD
Withlacoochee East Conservation Area	SRWMD
Withlacoochee West Conservation Area	SRWMD
Woods Ferry Conservation Area	SRWMD

Local Government	Managing Agency
Gibson Park	Hamilton County

Private Entity	Managing Agency
Militzer Luther Preserve	Alachua Conservation Trust

Acronym Key	Agency Name
DEP	Florida Department of Environmental Protection
FDACS	Florida Department of Agriculture and Consumer Services
SRWMD	Suwannee River Water Management District
USFS	U.S. Department of Agriculture, Forest Service

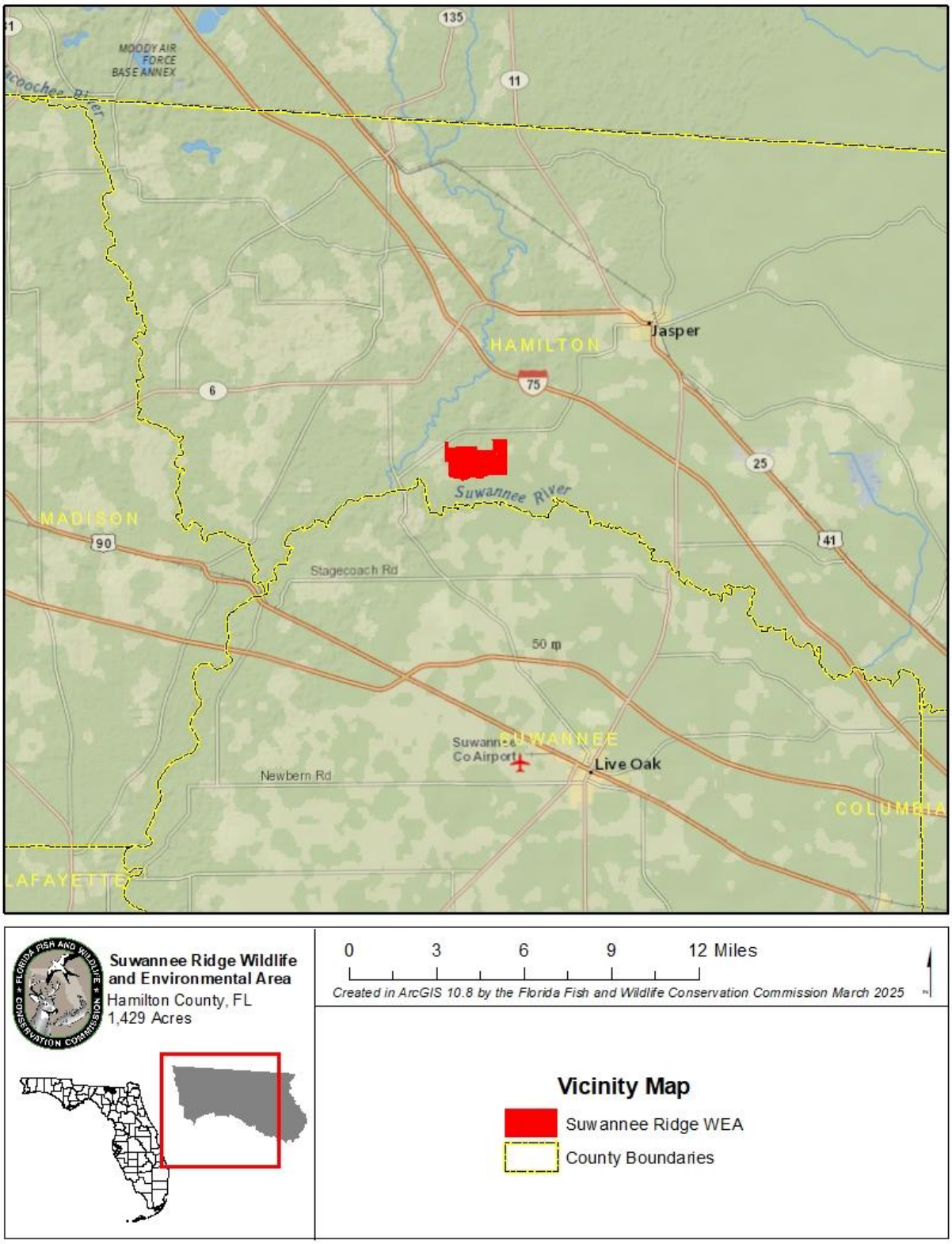


Figure 1. Vicinity Map

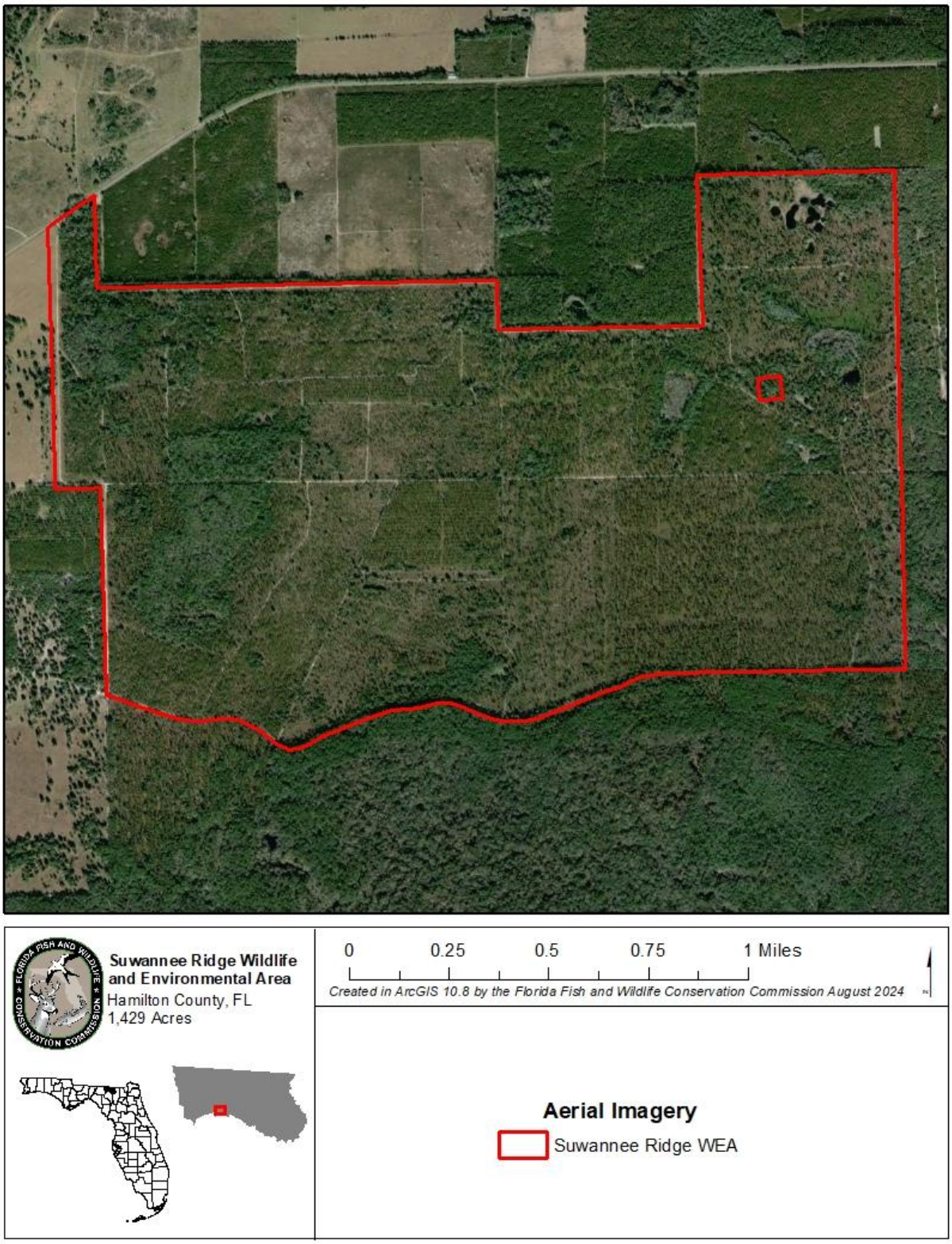


Figure 2. Aerial Imagery

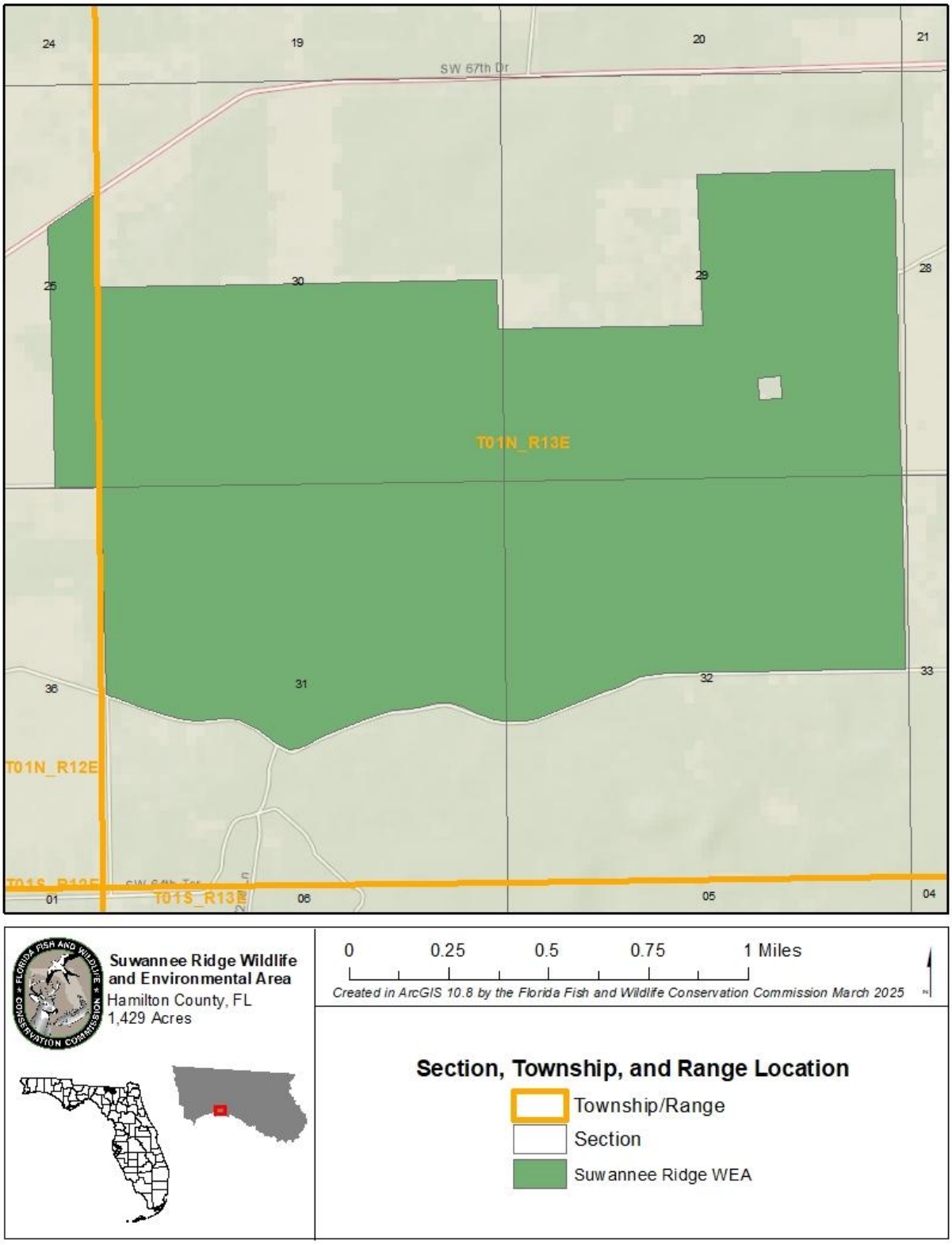
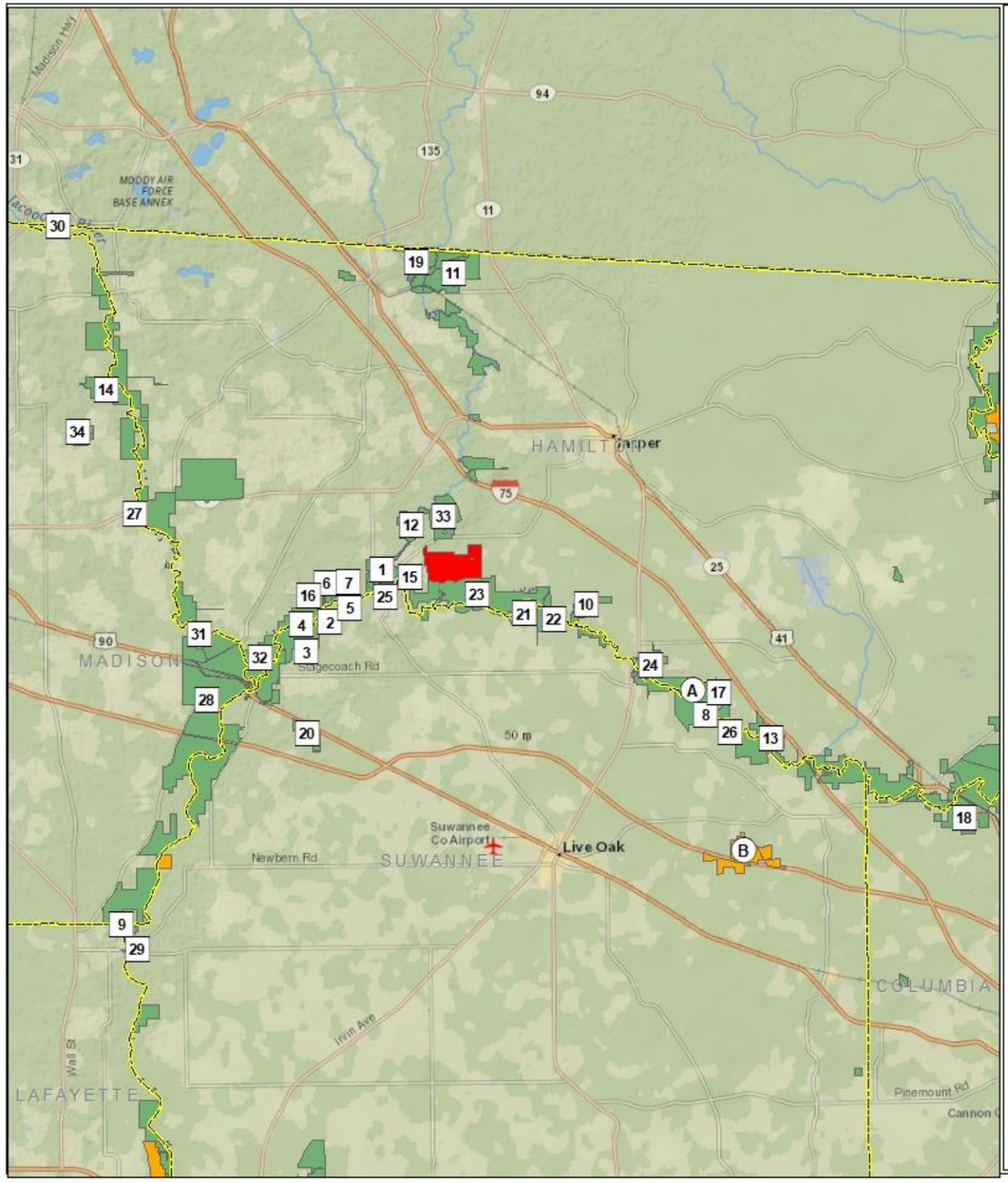


Figure 3. Section, Township, and Range Location



Conservation Lands within 15 miles of SRWEA

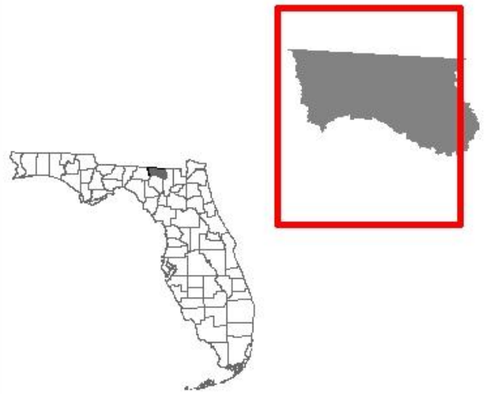
1 Adams Tract
2 Adams-Alapaha Agricultural and Conservation Easement
3 Camp Branch Conservation Area
4 Donaldson Tract
5 Falmouth Conservation Area
6 Falmouth Spring Conservation Area
7 Florida Youth Ranches Conservation Easement
8 Fort Union Conservation Area
9 Gibson Park
10 Goolsby Tract
11 Holton Creek Conservation Area
12 Lower Alapaha Conservation Area
13 Madison Blue Spring State Park
14 Madison County Conservation Area
15 Mericle Conservation Easement
16 Michel Tract
17 Militzer Luther Preserve
18 Richards Tract
19 Sanders Conservation Easement
20 Suwannee River Farms Conservation Easement
21 Suwannee River Farms Management Area
22 Suwannee River State Park
23 Suwannee River State Park Connector
24 Suwannee River State Park Conservation Area
25 Suwannee River Wilderness State Trail
26 Suwannee Valley Conservation Area
27 Swift Creek Conservation Area
28 Twin Rivers State Forest
29 Upper Alapaha Conservation Area
30 Upper Alapaha Conservation Easements
31 Warner/Harrell Conservation Easement
32 Withlacoochee East Conservation Area
33 Withlacoochee West Conservation Area
34 Woods Ferry Conservation Area

Florida Forever Projects within 15 miles of SRWEA

A Strategic Managed Area Lands List
B Suwannee County Preservation

Suwannee Ridge Wildlife and Environmental Area

Hamilton County, FL
1,429 Acres



Legend

Suwannee Ridge WEA
Florida Forever Projects
Conservation Lands
County Boundaries

N

0 5 10 15 Miles

Created in ArcGIS 10.8 by the Florida Fish and Wildlife Conservation Commission April 2025

Figure 4. Nearby Conservation Lands and Florida Forever Projects

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1.2 Title Interest and Management Authority

As state-owned lands, title to the SRWEA is vested in the Board of Trustees. In 2002, the DSL, as staff to the Board of Trustees, entered a 50-year lease agreement (Lease Agreement Number 4405) granting the FWC management authority for the SRWEA (Appendix 11.1). Further management authority derives from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 373, 375, 378, 379, 403, 487, 597, and 870 of the F.S. These constitutional provisions and laws provide the FWC with the authority to protect, conserve, and manage the state's fish and wildlife resources.

The Board of Trustees' Lease Agreement Number 4405 with the FWC also directs the FWC to "manage the leased premises only for the conservation and protection of natural and historical resources and resource-based, public outdoor recreation which is compatible with the conservation and protection of these public lands, as set forth in subsection 253.023(11), F.S...." The lease agreement further directs the FWC to "implement applicable Best Management Practices for all activities under this lease in compliance with paragraph 18-2.018(2)(h), F.A.C., which have been selected, developed, or approved by lessor, lessee, or other land managing agencies for the protection and enhancement of the leased premises".

1.3 Acquisition

1.3.1 Acquisition History

The FWC acquired the lands as a Gopher Tortoise Mitigation Park from Hamilton County Timberlands, LLC. The SRWEA was acquired with funds received through the FWC's Fish and Wildlife Habitat Program from gopher tortoise permits.

Selection of the SRWEA was based on conformance to a set of site selection criteria used to evaluate candidate mitigation sites that included cost, manageability, habitat quality, and significance to upland listed wildlife. Acquisition of the property was approved by the FWC on March 29, 2001, and by the Board of Trustees on February 13, 2002.

1.3.2 Purpose for Acquisition of the Property

The FWC began managing the SRWEA in 2002 under the FWC's Fish and Wildlife Habitat Acquisition Program for the purpose of establishing a Gopher Tortoise Mitigation Park to restore and conserve optimum habitat for rare and imperiled wildlife populations, principally the gopher tortoise and associated species, and to provide compatible fish and wildlife-focused public outdoor recreation, environmental education, and research opportunities. In accordance with 68A-17, F.A.C., Gopher Tortoise Mitigation Parks are now established by the FWC as WEAs.

The FWC implemented the now defunct Mitigation Park Program in 1998 to provide land use regulatory programs as an off-site alternative to on-site protection for rare species impacted by development under Section 372.074, F.S., since replaced by Chapter 379, F.S., which establishes the Fish and Wildlife Habitat Program for the purpose of acquiring, assisting other agencies or local governments in acquiring, or managing lands important to the conservation of fish and wildlife. Under this authority, the FWC, or its designee, is responsible for managing these lands

for the primary purpose of maintaining and enhancing their habitat value for fish and wildlife and providing compatible fish and wildlife-focused public outdoor recreation.

Areas like the SRWEA were established to provide conservation of important fish and wildlife habitat and public outdoor recreation within a multiple-use management regime that is primarily focused on restoration and management of gopher tortoise habitat. For this reason, management activities emphasize the maintenance and restoration of habitat for listed species.

1.3.3 Encumbrances

Encumbrances on the property include an access easement to a cemetery site located as an inholding out-parcel within the established boundary and outstanding mineral rights. While phosphate and sand mines are operated in the vicinity, it was the opinion of state and private reviewers at the time of acquisition that since the surface access rights to the outstanding mineral rights have expired, these outstanding rights do not pose a threat to the long-term conservation of the SRWEA, nor do they pose any impediment to the management of the area.

1.4 Planning Philosophy

The FWC emphasizes consensus-building to engage, understand, and incorporate the ideas of the various interests, user groups, and communities that it serves. To achieve this, the FWC convenes a Management Advisory Group (MAG) meeting which engages stakeholders from various user groups at the beginning of FWC's planning process and a public hearing in which the public can provide formal testimony.

The FWC maintains transparency and accountability throughout the development and implementation of the Management Plan by following a "living document" concept which links each plan with the previous plan by reporting on the objectives, management activities, and projects accomplished over the last planning timeframe (see Section 4). The Management Plan serves as the guiding framework to implement an adaptive management process and content will be evaluated throughout the planning period to achieve comprehensive conservation goals (Section 5). As needed, amendments to Management Plans are presented to the DSL and ARC for review and consideration.

1.5 Public Involvement

The FWC conducted a MAG meeting in Jasper, Florida on October 16, 2024, to obtain input from both public and private stakeholders regarding management of the SRWEA. Results of this meeting were used by the FWC to develop management goals and objectives and to identify opportunities and strategies for management to include in the update to this Management Plan (Appendix 11.3.1). Further, a public hearing, as required by Chapter 259.032(10), F.S., was held in Jasper, Florida on December 10, 2024, to solicit input and comments from the general public regarding this Management Plan. A Management Prospectus was made available to the public 30 days prior to the hearing. A report of that hearing can be found in Appendix 11.3.2. A website is also maintained for receipt of public input. Further testimony and input are received at a public meeting held by ARC. Input received from all public involvement efforts is considered in the development of the update to this Management Plan.

2 Natural and Cultural Resources

2.1 Physiography

2.1.1 Topography and Geologic Formations

The SRWEA is in the Ocala Karst District, as well as a region that contains Statenville Formations, Suwannee Limestone, and Undifferentiated Sediments. Statenville Formations are characterized by interbedded sands, clays, and dolostones with phosphate grains; these formations have low permeability, forming part of the intermediate confining unit of the Florida Aquifer System. Suwannee Limestone contains silicified limestone and a variety of fossils and consists of whitish, poorly to well indurated, limestone. The Undifferentiated Sediments found in this area are from the Pleistocene/Holocene eras; they have a varying thickness of Undifferentiated Sediments consisting of siliclastics, organics, and freshwater carbonates. Specifically, on the SRWEA, the maximum elevation is 120 feet above mean sea level. The SRWEA does not contain beaches, dunes, or virgin timber.

2.1.2 Soils

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) data were used to identify the SRWEA soil series and depth-to-water table. The map units described in the soil survey of the SRWEA are distributed as shown in Figure 5. Analyses of the depth-to-water table on the SRWEA are also provided in Figure 6. The NRCS defines a soil map unit as: “a collection of soil areas or non-soil areas (miscellaneous areas) delineated in a soil survey.”[1] Soil map units may contain multiple soil components, which are given names that are unique identifiers. Appendix 11.8 lists the names and official map unit descriptions as determined by the NRCS. Specific soils found on the SRWEA are as follows: Albany fine sand (5.80%); Alpin sand (41.37%); Blanton sand (34.79%); Blanton fine sand (0.85%); Chipley sand (0.31%); Foxworth sand (0.41%); Ocilla loamy fine sand (11.49%); Pamlico muck (0.85%); Pelham sand (0.64%); Plummer and Surrency soils (1.55%); Plummer sand (0.81%); Sapelo sand (1.03%); and Wahee fine sandy loam (0.09%).[1]

2.1.3 Weather Conditions

In general, moderate climates occur in Hamilton County. The SRWEA is characterized by long, warm summers and mild winters. The average daily winter temperature over the last 10 years has been 58˚ Fahrenheit (F), with an average minimum temperature of approximately 55˚F. The average daily summer temperature is 79˚F with an average maximum temperature of approximately 81˚F.[2] Over the last 10 years, the SRWEA has seen an average annual rainfall of 54 inches with the majority occurring in the summer season.[2]

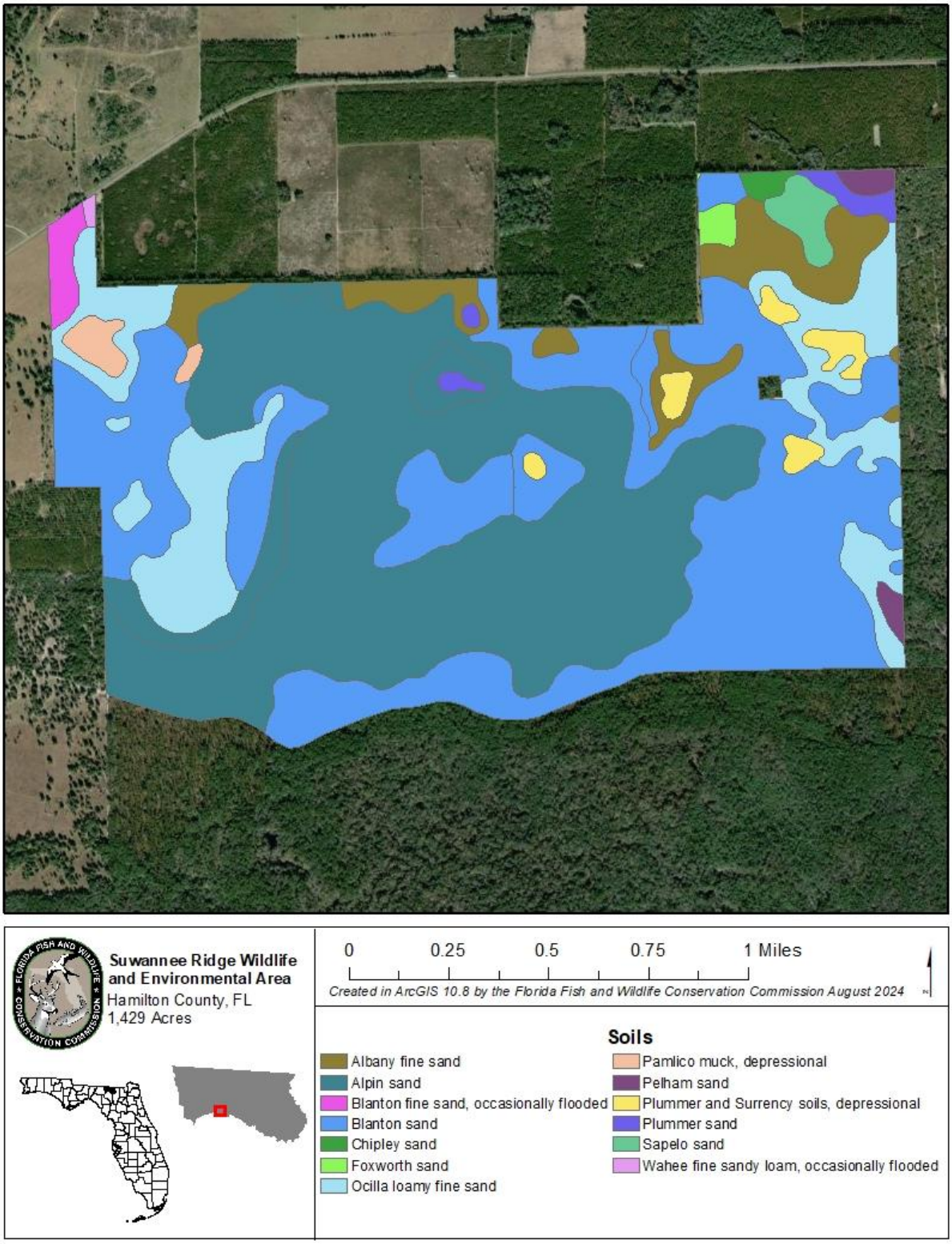


Figure 5. Soils

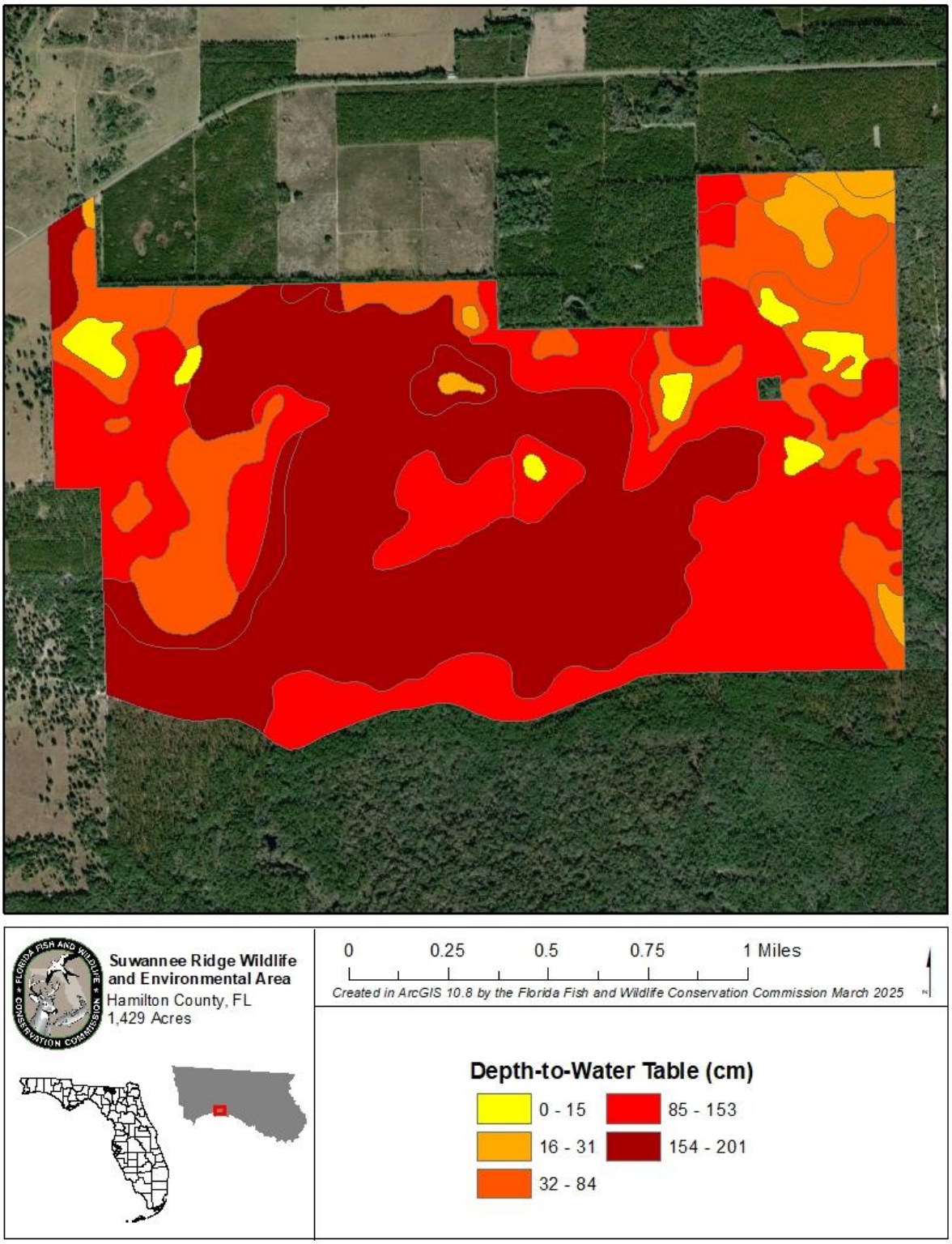


Figure 6. Depth-to-Water Table

2.2 Vegetation

Through the services of the Florida Natural Areas Inventory (FNAI), the FWC has mapped the current and historic natural communities and altered land cover types of the SRWEA and documented 11 natural communities and altered landcover types on the SRWEA (Table 3, Figures 7 and 8).

Additionally, native plant species found on the SRWEA have been documented and recorded by either FWC staff or contractors (Appendix 11.4.1). Currently, five imperiled plant species and 27 non-native plant species have been documented on the area (Tables 4 and 5, Sections 2.2.1 and 2.2.2).

Table 3. Natural Communities and Altered Landcover Types

Community Type	GIS Acres	Percentage
Basin Marsh	1.37	0.1%
Depression Marsh	13.64	0.9%
Dome Swamp	14.40	1.0%
Road	81.11	5.6%
Sandhill	1,058.69	73.6%
Sinkhole	16.89	1.2%
Successional Hardwood Forest	12.49	0.9%
Upland Hardwood Forest	16.84	1.2%
Upland Mixed Woodland	103.59	7.2%
Upland Pine	103.66	7.2%
Wet Flatwoods	15.53	1.1%

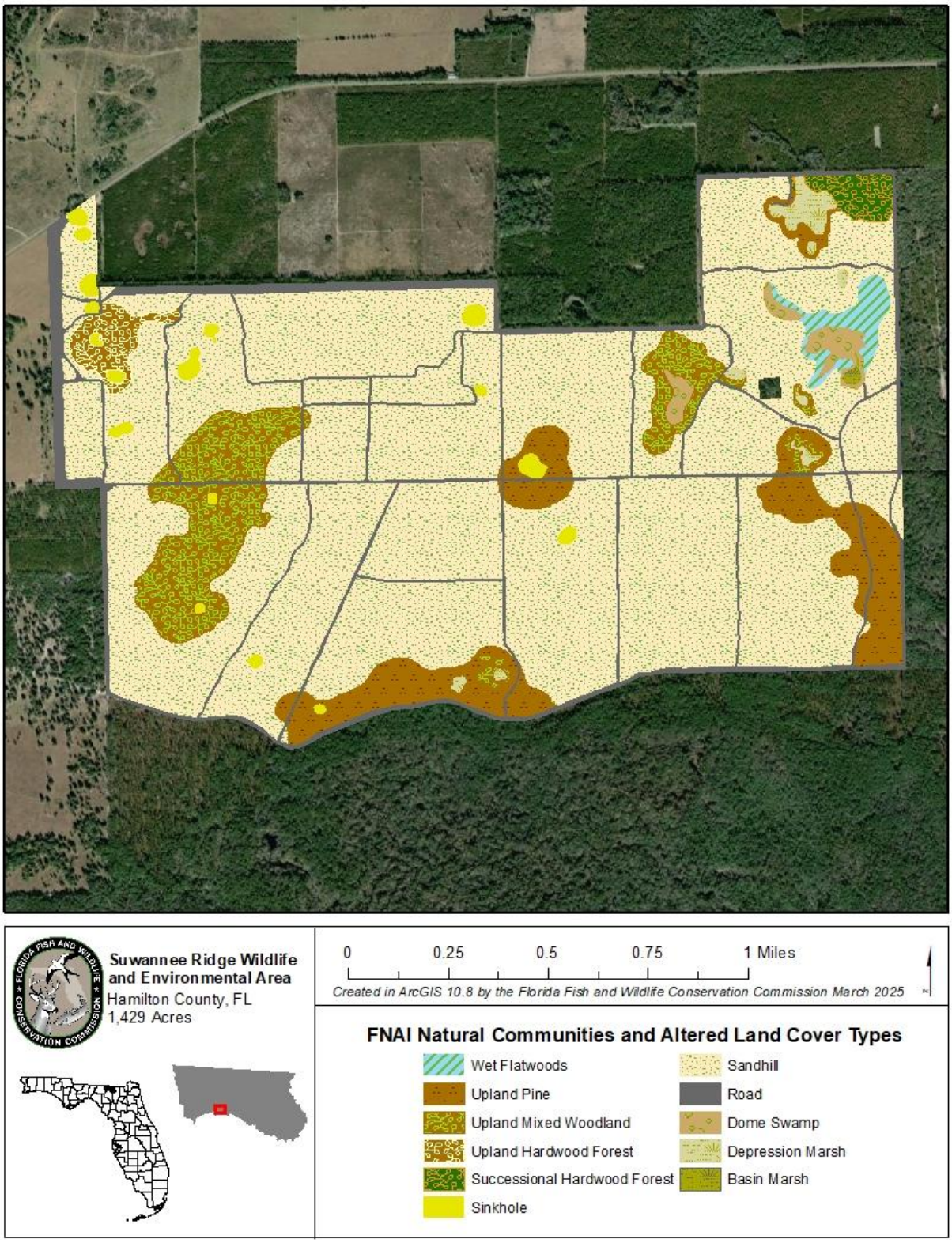


Figure 7. FNAI Natural Communities and Altered Landcover Types

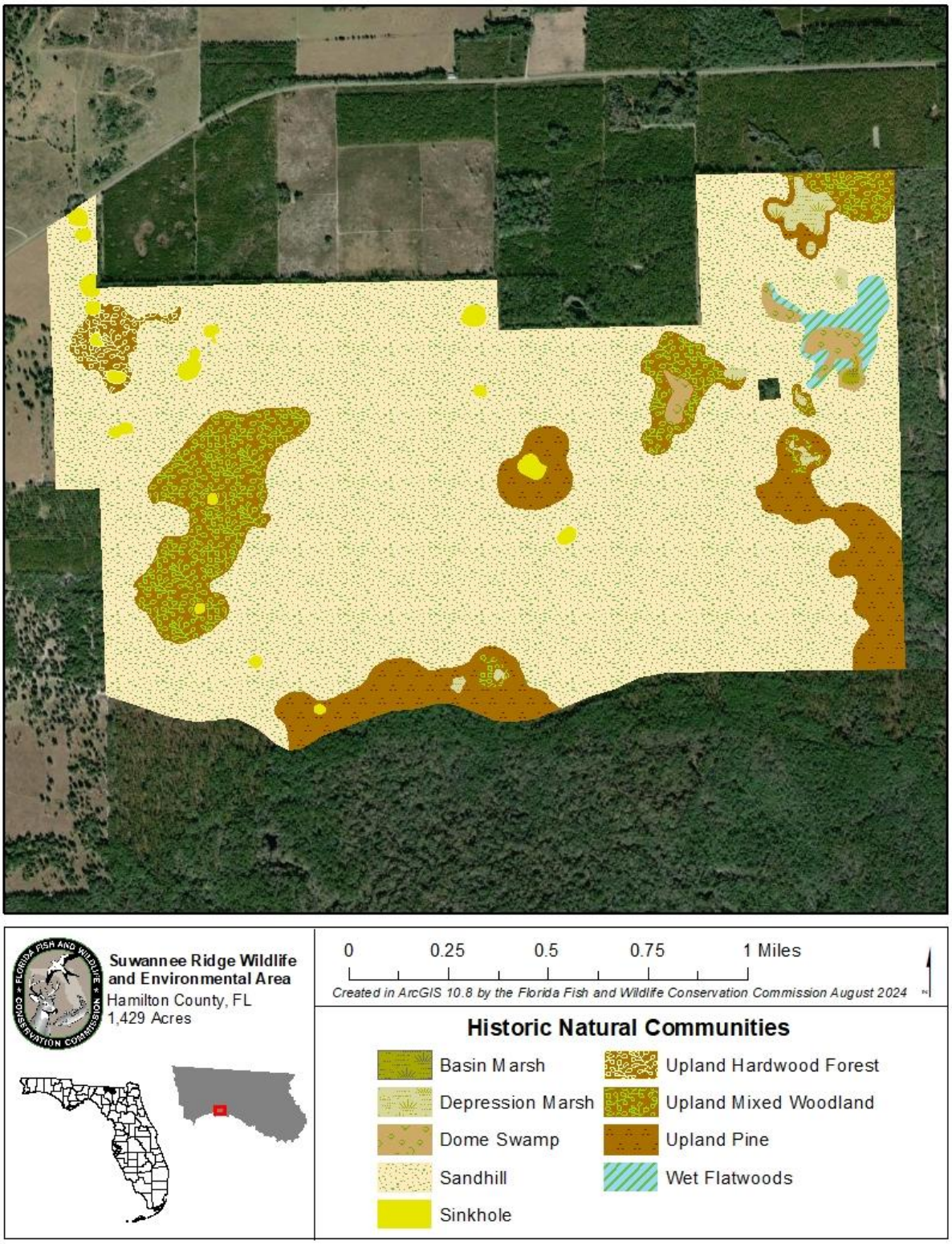


Figure 8. Historic Natural Communities

2.2.1 Imperiled Plants

For the purposes of this Management Plan, the term “imperiled species” as it relates to plants refers to plant species that Florida Department of Agriculture and Consumer Services (FDACS) or the United States Fish and Wildlife Service (USFWS) has designated as Endangered or Threatened. This designation is commonly known as “listed species”, and all names and status determinations were derived from Florida’s Regulated Plant Index Rule (5B-40.0055, F.A.C.) that is maintained by FDACS.

FNAI conducted a rare plant survey in Fiscal Year 2017/2018 on the SRWEA and identified five imperiled plant species, of which one is state-designated Endangered and four are state-designated Threatened (Table 4). The protections afforded plants that occur on conservation lands, in conjunction with management actions including invasive plant removal and prescribed fire, will continue to maintain and enhance habitat for these and other imperiled plants. As such, these species should persist under planned management on the SRWEA.

In addition to the imperiled plants, three plants state-designated as Commercially Exploited are known to occur on the SRWEA (Table 4). The FWC will continue to monitor the known occurrences of these species and report any illegal collection to the appropriate authorities

Table 4. Imperiled Plant Species

Scientific Name	Common Name	Status	FNAI Ranks*
Agrimonia incisa	Harvest lice	ST	G3 / S2
Eulophia ecristata	Non-crested eulophia	ST	G4 / S4
Matelea floridana	Florida spiny-pod	SE	G2 / S2
Matelea gonocarpos	Angle pod	ST	G5 / SNR
Osmunda cinnamomea	Cinnamon fern	CE	G5 / S4
Osmunda regalis	Royal fern	CE	G5T5 / S5
Pycnanthemum floridanum	Florida mountain-mint	ST	G3 / S3
Rhapidophyllum hystrix	Needle palm	CE	G4 / S4

*Explanations of FNAI ranks can be found in Appendix 11.7

Acronym	Status
CE	Commercially Exploited (State designation)
SE	State Endangered
ST	State Threatened

It is possible other imperiled species occur on the SRWEA, and, if encountered, staff will document these occurrences. Florida’s imperiled species are adapted to natural communities and should continue to benefit from the FWC's ongoing and planned management to maintain and enhance natural community structure and function. Under the FWC’s management, these species have a higher probability of persistence than in the absence of this management. However, while habitat management provides overall benefits to a host of species reliant upon these natural communities, imperiled species sometimes require specific attention. Detailed descriptions of rare plants known to occur on the SRWEA can be found in Appendix 11.6.

2.2.2 Non-native Plants

FWC biologists and contractors have documented 27 non-native plant species on the SRWEA, five of which are invasive (Table 5). Species that are considered invasive are species that (a) are non-native to a specified geographic area; (b) were introduced by humans (intentionally or unintentionally); and (c) do or can cause environmental, economic, or human harm. The FWC relies on the Florida Invasive Species Council (FISC) for the categorization of invasive plant species.

Table 5. Non-native Plant Species

Scientific Name	Common Name	FISC Category
Albizia julibrissin	Silktree, Mimosa	I
Crotalaria lanceolata	Lanceleaf rattlebox	-
Crotalaria spectabilis	Showy rattlebox	-
Cuphea carthagenensis	Colombian waxweed	-
Cynodon dactylon	Bermudagrass	-
Desmodium incanum	Zarzabacoa comun	-
Dysphania ambrosioides	Mexican tea	-
Eremochloa ophiuroides	Centipede grass	-
Hedera helix	English ivy	-
Hyptis mutabilis	Tropical bushmint	-
Imperata cylindrica	Cogongrass	I
Indigofera hirsuta	Hairy indigo	-
Kummerowia striata	Japanese clover	-
Lespedeza bicolor	Shrubby lespedeza	-
Lygodium japonicum	Japanese climbing fern	I
Melia azedarach	Chinaberry	II
Melilotus albus	White sweetclover	-
Mollugo verticillata	Indian chickweed	-
Paspalum notatum	Bahiagrass	-
Richardia brasiliensis	Tropical mexican clover	-
Scutellaria drummondii	Drummond's skullcap	-
Setaria pumila	Yellow foxtail	-
Sorghum halepense	Johnsongrass	-
Sporobolus indicus	Smutgrass	-
Triadica sebifera	Chinese tallow, Popcorn tree	I
Verbena incompta	Purpletop vervain	-
Wahlenbergia marginata	Southern rockbell	-

2.3 Fish and Wildlife Resources

As described above, the SRWEA has a variety of natural communities and habitat types that support a wide array of imperiled and more common wildlife species. Active wildlife management practices make the SRWEA an excellent place to observe wildlife. The SRWEA's sandhill, upland mixed woodland, upland pine and other natural communities provide critical habitat for resident and migratory wildlife. The FWC maintains an inventory of fauna occurring on the SRWEA listed in Appendix 11.4.2, including mammals, birds, reptiles, amphibians, and invertebrates.

2.3.1 Imperiled Fish and Wildlife

For the purposes of this Management Plan, the term "imperiled fish and wildlife" refers to animal species that are currently designated as Threatened or Endangered by the FWC or the USFWS. This designation is also commonly known as "listed species." Table 6 outlines all imperiled fish and wildlife that have been observed on the SRWEA.

Table 6. Imperiled Fish and Wildlife Species

Scientific Name	Common Name	Status	FNAI Ranks*
Gopherus polyphemus	Gopher tortoise	ST	G3, S3
Pituophis melanoleucus mugitus	Florida pine snake	ST	G4, S3

*Explanations of FNAI ranks can be found in Appendix 11.7

Acronym	Status
ST	State Threatened

At its November 2016 Commission meeting, the FWC approved Florida's Imperiled Species Management Plan, which included changes to the listing status for many wildlife species. Subsequent rule changes (68A-27.003 and 68A-27.005, F.A.C.) have come into effect since the Imperiled Species Management Plan was approved and those changes have been incorporated into this Management Plan. All federally listed species that occur in Florida are included in Florida's Endangered and Threatened Species list as federally-designated Endangered or Threatened. Species that are not federally listed, but which have been identified by the FWC as being at some level of risk of extinction, are state-designated as Threatened.

Gopher Tortoise Recipient Site Eligibility

Per Chapter 259.01 F.S., the FWC has evaluated the SRWEA for eligibility as a recipient site for gopher tortoises. The SRWEA has a robust resident gopher tortoise population and is one of our FWC-lead areas selected for long-term gopher tortoise monitoring. Due to the existing population of gopher tortoises on the SRWEA, the FWC has determined that it is not a feasible recipient site.

2.3.2 Non-native Wildlife Species

In addition to the native wildlife species listed in Appendix 11.4.2, three non-native wildlife species have been documented on the SRWEA (Table 7). The FWC will continue to document any occurrences of non-native species found. More information on monitoring and management of non-native wildlife can be found in Section 4.5 and Section 5.4.

Table 7. Non-native Fish and Wildlife Species

Scientific Name	Common Name
Bubulcus ibis	Cattle egret
Eleutherodactylus planirostris	Greenhouse frog
Sus scrofa	Wild hog

2.3.3 FNAI Element Occurrences

A diversity of wildlife species is found on the SRWEA. The FWC uses the FNAI Natural Heritage Database to assist in identifying and recording resources on FWC-managed areas. This database also supplemented the development of the species tables found in Appendix 11.4. FNAI's Natural Heritage Database is a comprehensive compilation of records documenting the location and ecological status of rare plant and animal species in the state. The database consists of "element occurrences", where an "element" is any exemplary or rare component of the natural environment, such as a species, natural community, or other ecological feature; and an "element occurrence" is an area of land and/or water where an element is, or was, present. FNAI scientists "track" (collect information on) approximately 233 vertebrates, 562 invertebrates, and 492 plants representing approximately 13% of the state's vertebrate species, less than 5% of the invertebrates, and about 12% of the plants. The status of each tracked element is assessed using standardized methodology; each tracked element is assigned ranks that reflect its rarity and degree of imperilment at the global and state level. These ranks are applied using a standardized methodology that incorporates many factors, including geographic range; number, size, and condition of known occurrences; population size and trends; life history characteristics; and threats. The Natural Heritage ranking system and definitions are in Appendix 11.7 and may be found online.

The FNAI element occurrence records include 18 occurrences of wildlife species in the vicinity of the SRWEA. Several of the imperiled species discussed in Section 2.2.1 and Section 2.3.1 in this report are tracked by FNAI. These species and their ranks are listed in Table 6. Appendix 11.11 contains a letter from FNAI authorizing the FWC to utilize their database for the purpose of identifying known plant and animal resources. The following additional species at the SRWEA are tracked by FNAI:

Scientific Name	Common Name	FNAI Ranks*
Crotalus adamanteus	Eastern diamondback rattlesnake	G3/S3
Crotalus horridus	Timber rattlesnake	G4/S3
Egretta thula	Snowy egret	G5/S3
Elanoides forficatus	Swallow-tailed kite	G5/S2
Eudocimus albus	White ibis	G5/S4
Eutrichota gopheri	Gopher tortoise burrow fly	G2/S2S3
Haliaaetus leucocephalus	Bald eagle	G5/S3
Heterodon simus	Southern hognose	G2/S2S3
Idia gopheri	Gopher tortoise noctuid moth	G2G3/S2S3

Machimus polyphemi	Gopher tortoise robber fly	G2/S1S2
Pandion haliaetus	Osprey	G5/S3S4
Peucaea aestivalis	Bachman's sparrow	G3/S3
Phidippus workmani	Workman's jumping spider	G4/S4
Sciurus niger niger	Southern fox squirrel	G5T5/S3

*Explanations of FNAI ranks can be found in Appendix 11.7

2.4 Water Resources

All surface waters of the state are classified by the DEP according to designated uses as described in Chapter 62-302.400, F.A.C. The surface waters of the SRWEA consist of two ponds, neither of which are designated as Outstanding Florida Waters (OFW) or Outstanding National Resource Waters (Chapter 62-302.700, F.A.C.). The Suwannee River OFW is immediately south, less than 0.25 miles from the SRWEA. The SRWEA is not located within or adjacent to an aquatic preserve.

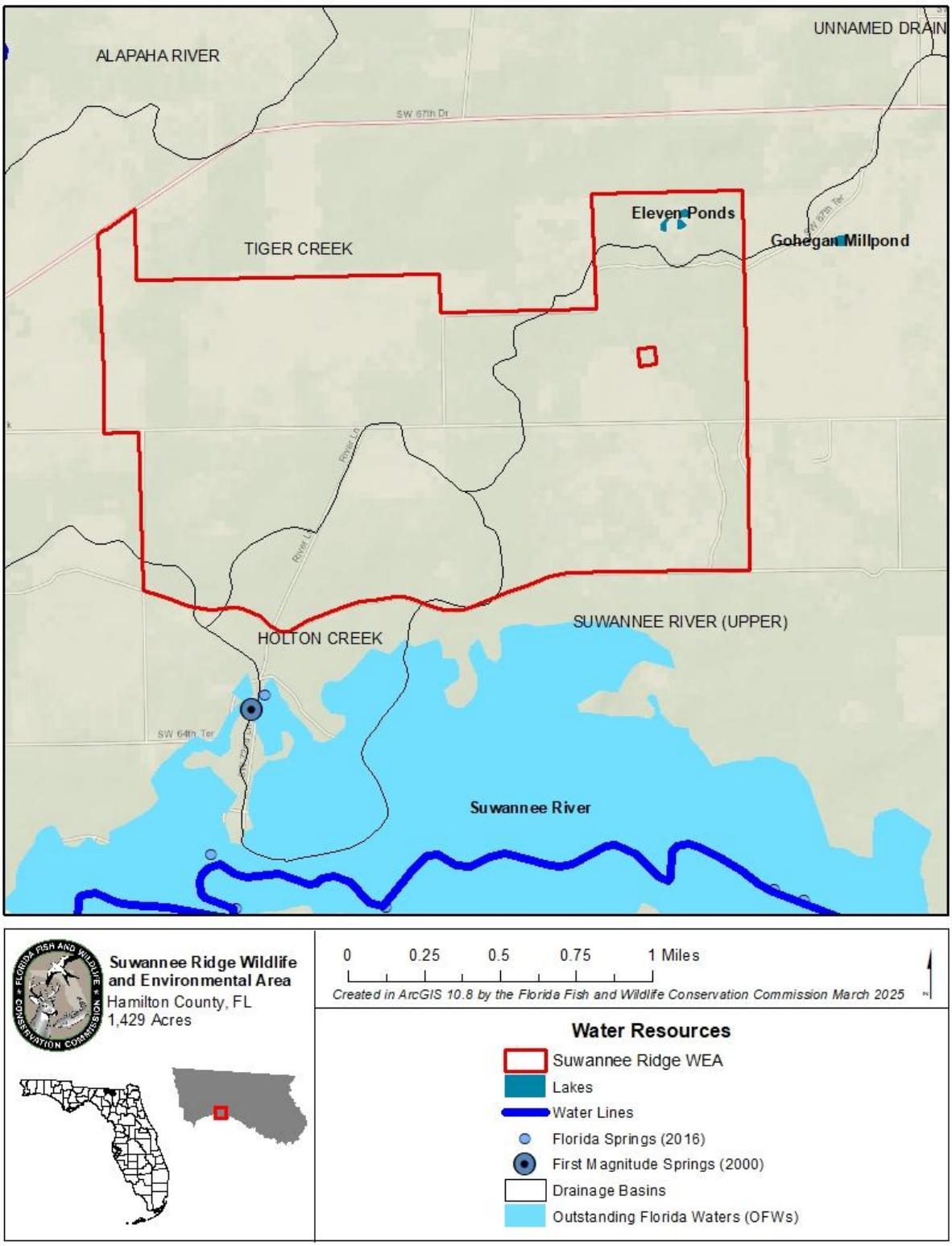


Figure 9. Water Resources

2.5 Forest Resources

Pine stands in the SRWEA are comprised of sandhill and are now dominated by natural or planted longleaf pine, whereas pine stands in other management units comprised of pine flatwoods are now dominated by plantations of slash pine (*Pinus elliottii*) and, less frequently, loblolly pine (*Pinus taeda*). Target objectives for restored, forested natural communities call for pine overstories composed predominately of longleaf pine within a basal area range of 30-60 ft^2/acre; with small openings of less than 0.25 of an acre in size scattered throughout the tract; fine fuel conditions that promote safe, routine, and perpetual use of prescribed fire; and structural diversity within or among management units. The FWC will manage the pine forests with prescribed fire with natural regeneration of the longleaf forest as the primary method of forest sustainability, to aid in habitat and species conservation, as well as provide public recreation opportunities.

2.6 Beaches and Dunes

The SRWEA does not contain any beaches or dunes.

2.7 Mineral Resources

According to the University of Florida soil survey of Hamilton County, the principle mineral resources in the county are sand, clay, limestone, and phosphate. Throughout the county, there are a number of shallow pits that are mined for sand and fill. This sand is of the Pleistocene and overlays the Hawthorn group sediments. Deposits of clay and sandy clay are associated with Pleistocene and Holocene aged marine terrace deposits and alluvium with the Hawthorn Group sediments. Limestone deposits occur at or near the surface in the southwestern part of the county on the Gulf Coastal Lowlands and adjacent to the Suwannee River. Most of the near-surface limestone is associated with the Suwannee Limestone and Ocala Group. Phosphate is mined in the southeastern part of the county. One mine is northwest of White Springs, and another is northeast of White Springs. The phosphate ore is contained in the Miocene aged Hawthorne Group sediments. It is extracted with the sand and clayey sand matrix by large draglines. Beneficiation of the phosphate is accomplished through a flotation process that separates the quartz matrix sands and clays from the phosphate ore. The phosphate is used primarily as agricultural fertilizer. The potential for phosphate mining in the southeastern part of the county remains high. Other possible mineral resources in Hamilton County include aluminum, fluorine-fluorite, iron, magnesite, uranium, and sand. Different types of sand make up 97% of this area. Each type of sand is listed in the soil section above.

2.8 Cultural Resources

The Florida Master Site File (FMSF), maintained by the Florida Department of State's Division of Historical Resources (DHR), is the State of Florida's official inventory of cultural resources, archaeological and historical survey reports, and other manuscripts relevant to historic preservation in Florida. Categories of resources recorded at the FMSF include archaeological sites, historical structures, historical cemeteries, historical bridges, and historical resource groups (comprised of historic districts, landscapes, and linear features).

To date, the FMSF indicates that one previous cultural resource survey has been conducted on the SRWEA. None of the identified cultural resources have been determined eligible for inclusion

in the National Register of Historic Places (Table 8). The FWC consults with the DHR to determine the necessary actions for resource inventory and preservation. All identification, assessment, and preservation strategies are developed in consultation with the DHR.

Table 8. Cultural Resources

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
HA00586	Archeological Site	Bellflower Fields	10.42	Undetermined
HA00589	Archeological Site	Buck Rub Scatter	0.35	Undetermined
HA00587	Archeological Site	Confederate Rattlesnake Fork	11.21	Undetermined
HA00584	Archeological Site	Eleven Ponds Creek	2.66	Undetermined
HA00585	Archeological Site	Eleven Ponds West	2.45	Undetermined
HA00590	Archeological Site	Found Lost Compass	1.90	Undetermined
HA00579	Archeological Site	North Gate Sinks	5.47	Undetermined
HA00583	Archeological Site	Sawdust Ponds	16.91	Undetermined
HA00581	Archeological Site	Suwannee Ridge Deep Sink	11.50	Undetermined

2.9 Scenic Resources

The SRWEA has an outstanding native landscape and offers scenic views of actively managed upland pine and sandhill habitats. Areas within the SRWEA that were previously used in silviculture have been replanted with longleaf pine to restore the area to its historic plant community. Sinkhole depressions located across the site may be environmentally sensitive. The hardwood swamps are regularly inundated wetlands generally consisting of sinkhole depressions or basin swamps that are tied to water level stages in the Suwannee and Alapaha rivers.

As part of a network of sites creating a wildlife corridor, the SRWEA provides excellent opportunities for wildlife watching of resident and migratory birds, as well as a variety of protected species such as the gopher tortoise and the Southern fox squirrel (*Sciurus niger niger*).

3 Uses of the Property

3.1 Previous Use and Development

A review of historical aerial photography indicates the site has been used predominantly for timber production. Many of the roads and logging trails now in existence appear in old photographic records. The SRWEA was originally owned by Mr. Rayonier prior to Hamilton County Timberlands, LLC, and the tract was managed primarily to produce pulpwood and other wood commodities. At the time of state acquisition, all upland sites were planted in longleaf, slash, or sand pine (*Pinus clausa*). Prior to state ownership, the property was apparently open to public use, including hunting, fishing, and artifact collection. Evidence of trash disposal, all-terrain vehicle use, and other forms of resource degradation were visible throughout the parcel at the time of acquisition.

3.2 Current Use

Currently, the SRWEA is managed for the conservation and protection of fish and wildlife habitat and fish and wildlife-focused public outdoor recreation. A wide range of operational and resource management actions are conducted on the SRWEA each year, including activities such as prescribed burning; wildlife habitat restoration and improvement; invasive species maintenance and control; road repairs and maintenance; imperiled and locally important species management, monitoring, and protection; facilities and infrastructure maintenance; conservation acquisition and stewardship activities; cultural resources monitoring and protection; and research related activities.

The SRWEA is being managed as a multiple-use conservation land. Multiple-use management strategies incorporate uses related to wildlife, fisheries, forest management, and fish and wildlife-focused public outdoor recreation. Current and anticipated resource uses of the property are diverse. Public outdoor educational and recreational opportunities are provided that are compatible with the original purposes for acquisition of the SRWEA. Mobility-impaired hunting continues to be a popular recreational activity. The area also offers excellent opportunities for wildlife watching. The diversity of vegetation not only harbors a variety of bird species but also provides good opportunities for mammalian and other wildlife watching. Additional uses include hiking, photography, and nature study. Due to the proximity of population centers in Hamilton County, public use can be expected to increase as public awareness of opportunities increases.

3.2.1 Hunting

Currently, the SRWEA offers mobility-impaired hunting opportunities, including general gun and spring turkey hunts when deer (*Odocoileus virginianus*), hogs (*Sus scrofa*), small game, and turkeys (*Meleagris gallopavo*) may be taken. Mobility-impaired hunters may be accompanied by a guest hunter and one non-hunting assistant. Hunting on the SRWEA is unique in that it is shared with its neighbor, the Holton Creek WMA. More information on hunting opportunities at the SRWEA can be found in the Hunting Regulations Summary Brochure.

3.2.2 Trails and Roads

Currently, the SRWEA offers a 1.2-mile marked loop trail which winds around a series of sinkholes, as well as 19.09 miles of roads. Hiking is available on all roads and trails within the SRWEA.

3.2.3 Camping

Camping is not permitted on the SRWEA; however, camping opportunities are available on nearby public lands.

3.2.4 Geocaching

Geocaching, also known as Global Positioning System (GPS) Stash Hunt and GeoStash, is a contemporary combination of orienteering and scavenger hunting generally utilizing a GPS receiver unit. Geocache websites routinely promote good stewardship. However, the potential exists for resource damage, user conflicts, or safety issues caused by inappropriately placed caches and/or links that do not provide adequate information about the area.

It is the policy of the FWC to allow placement of geocaches only in those locations that do not present the potential for resource damage, user conflicts, or threats to the safety of the activity participants. The placement of geocaches on FWC-managed lands is governed by specific guidelines. These guidelines may be found on the FWC website.

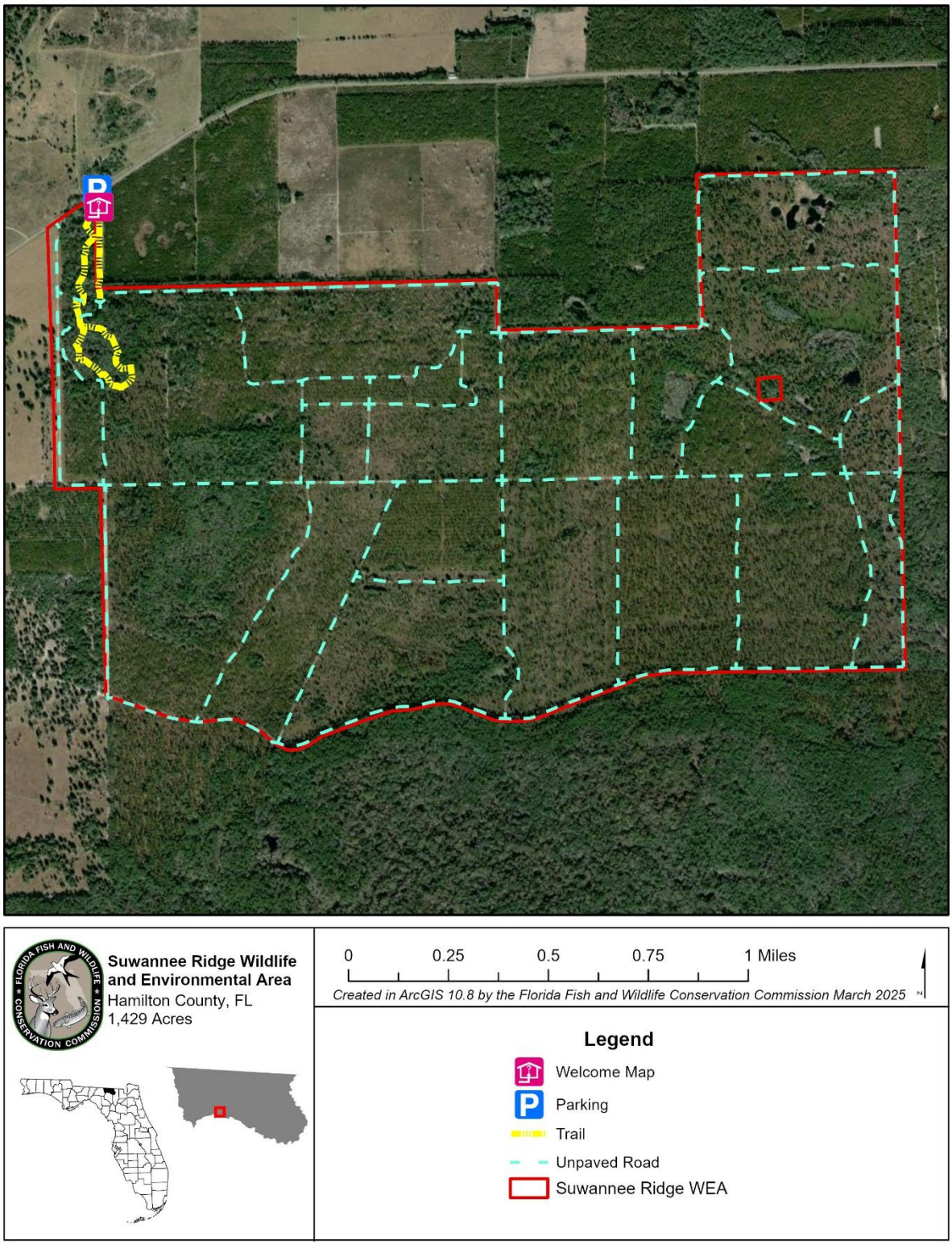


Figure 10. Facilities

3.3 Adjacent Land Uses

The SRWEA is in southwestern Hamilton County, west of the City of Marion. Holton Creek Conservation Area is located south and southeast of the SRWEA, and the Suwannee River is less than a mile south.

The 2019 U.S. Census estimated that there were 13,671 people living in Hamilton County. The Department of Economic Affairs, Bureau of Economic and Business Research's (BEBR) medium-range population projection indicates that there will be 14,000 people living in Hamilton County in 2030. The 2030 BEBR population projections for the counties surrounding Hamilton County are:

- Columbia – 75,400
- Madison – 18,800
- Suwannee – 47,600

The current zoning ordinance for the SRWEA is Environmentally Sensitive Areas-2. According to Hamilton County's Comprehensive Plan, this designation allows for one unit/10 acres. Hamilton County's future land use maps indicate that the SRWEA will continue to be designated and zoned as Environmentally Sensitive Areas-2. Lands immediately adjacent to the SRWEA are also classified as Environmentally Sensitive Areas-2.

3.4 Visitation, Economic Benefits, and Revenue-generating Potential

The FWC does not have a visitor counter at SRWEA but intends to deploy one during the period covered by this Management Plan. If the current maximum visitation level of 24 visitors per day were achieved, a total of 8,256 visitors per year could be expected. If the area were at carrying capacity, the FWC economic analysis estimates indicate that the SRWEA would generate an estimated annual economic impact of $1,613,140 for the state and the Northcentral Florida region. This estimated annual economic impact would aid in the support or creation of an estimated 16 jobs.*

Further revenue generating potential of the SRWEA will depend upon future uses described in this Management Plan and may include sales of various permits, recreational user fees, or other ecotourism activities, if such projects are feasible. The annual area regulations can be consulted to clarify the necessary and required permits, fees, and regulations. Additionally, the long-term value of ecosystem services, including the protection of air and water quality functions, are significant to local and regional land and water resources, as well as human health.

**The above figures are based on expenditure data from the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation (USFWS) and 2006 IMPLAN economic models assembled by Southwick Associates and the USFWS. The results were updated in 2010 based on hunting and fishing license trends and inflation. The results were combined and weighted based on the numbers of hunters, anglers, and wildlife viewers statewide. The results assume participants' expenditures and the values used to calculate these expenditures are consistent throughout the state. Users applying these results to local situations should be aware that*

differences might exist between these statewide averages and the site in question and make adjustments, if needed.

3.5 Single- or Multiple-use Management

As mentioned previously, the SRWEA will be managed under the multiple-use concept as a WEA. The SRWEA will provide fish and wildlife-focused public outdoor recreation opportunities, while protecting the natural and cultural resources found on the area. Any natural and cultural resources on the SRWEA will be managed under the guidance of the ARC, the Conceptual State Lands Management Plan, and as outlined in the original purposes for acquisition. A detailed assessment of the benefits and potential impacts of planned uses and activities on natural and cultural resources was an integral part of the development of the management activities and intent, goals, objectives, challenges, and strategies sections of this Management Plan.

3.5.1 Analysis of Multiple-use Potential

The following actions or activities have been considered under the multiple-use concept as possible uses to be allowed on the SRWEA. Uses classified as “Approved” are in accordance with the purposes for acquisition; the Conceptual State Lands Management Plan; and the FWC agency mission, goals, and objectives as expressed in the FWC Agency Strategic Plan. Uses classified as "Conditional" indicate that the use may be acceptable but will be allowed only if approved through a process other than the management plan development and approval process (e.g., special-use permitting, managed-area regulation and rule development). Uses classified as “Rejected” are not considered to be in accordance with the original purpose of acquisition or one or more of the various forms of guidance available for planning and management.

	Approved	Conditional	Rejected
Apiaries		✓	
Archery		✓	
Astronomy	✓		
Bicycling	✓		
Cattle grazing			✓
Citrus or other agriculture			✓
Ecosystem services and maintenance	✓		
Ecotourism		✓	
Environmental education	✓		
First-responder training		✓	
Fishing		✓	
Geocaching		✓	
Hiking	✓		
Horseback riding			✓
Hunting		✓	
Linear facilities			✓
Military training		✓	
Preservation of cultural resources	✓		
Primitive camping			✓
Protection of imperiled species	✓		
Off-road vehicle use			✓

Shooting sports park			✓
Soil and water conservation	✓		
Timber harvest		✓	
Wildlife observation	✓		

3.5.2 Incompatible Uses and Linear Facilities

Consideration of incompatible uses and linear facilities on the SRWEA are made in accordance with the requirements of Section 253.034(10), F.S.; various applicable Florida Constitution, statute, rule, and policy requirements; and other provisions governing applications for proposed incompatible uses or linear facilities on state-owned conservation lands. Upon approval and implementation of this Management Plan, any proposed future uses that have been classified herein as Rejected, or other proposed future uses that are determined to be incompatible with the purposes of acquisition or other management authorizations and guidance, will be forwarded for review and approval consideration to the DEP-DSL, ARC, and the Board of Trustees prior to any incompatible use or linear facility being authorized on the SRWEA.

3.6 Potential Surplus Review

On conservation lands where the FWC is the lead manager, the FWC evaluates and identifies recommended areas for a potential surplus designation by the DSL, ARC, and the Board of Trustees. This evaluation consists of Geographic Information Systems (GIS) modeling and analysis, aerial photography interpretation, analysis of fish and wildlife resources, a review of resource and operational management needs, and a review of public access and recreational use of the area. Also, the FWC considers recommendations for surplus lands as they relate to Florida's "No Net Loss of Hunting Lands" legislation (Ch. 379.3001, F.S.), as well as surplus restrictions for lands acquired through the Federal Aid in Wildlife Restoration Act (Pittman-Robertson) or through other federal grant programs.

The evaluation of the SRWEA by the FWC has determined that all portions of the area are being managed and operated for the original purposes of acquisition and remain integral to the continued conservation of important fish and wildlife resources and continue to provide good fish and wildlife-focused public outdoor recreational opportunities. Therefore, no portion of the SRWEA is recommended for potential surplus review.

4 Management Activities and Intent

The following section provides a description of agency plans to locate, identify, protect, preserve, or otherwise use fragile natural resources and non-renewable cultural resources. In general, the FWC management intent for the SRWEA is to restore and maintain natural communities in a condition that sustains ecological processes and conserves biological diversity, especially fish and wildlife resources. In conjunction with this primary emphasis, it is the FWC's intent to provide quality fish and wildlife-focused public outdoor recreational opportunities on the SRWEA. The FWC will utilize the best available data, guidelines, natural resource management practices, and recreational management practices to achieve these outcomes in accordance with the original

purposes for acquisition. Furthermore, as noted previously, the management activities described in this section comply with those of the Conceptual State Lands Management Plan.

4.1 Land Management Review

On-site reviews of conservation and recreation lands that exceed 1,000 acres and are titled in the name of the Board of Trustees are required every five years by Section 259.036, F.S. A Land Management Review was conducted for the SRWEA in 2021 (Appendix 11.9). These reviews determine whether the lands are being managed for the purposes for which they were acquired and whether they are being managed in accordance with their management plan adopted pursuant to Section 259.032, F.S. According to statute, the review team "shall evaluate the extent to which the existing management plan provides sufficient protection to Threatened or Endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan."

4.2 Adaptive Management

Adaptive management is "learning by doing";[3] it is the adjustment or modification of conservation actions to achieve a desired conservation goal. In practice, adaptive management is a rigorous process that includes sound planning and experimental design with a systematic evaluation process that links monitoring to management.[3, 4, 5] Adaptive management requires flexibility for implementation but should be fitted over a fundamentally sound, well-planned design.

An adaptive management process produces the strongest inference and most reliable results when experimental design components are incorporated into the monitoring process. Adaptive management is most rigorously applied in an active format when components of experimental design (i.e., controls, replication, and randomization) are included in the monitoring process.[3, 4, 5] Incorporating valid statistical analyses of results will further enhance the value of the adaptive management process. However, in some situations, rigorous experimental design procedures can be relaxed without invalidating monitoring results. In a passive format, adaptive management can involve applying a conservation action at a site, observing the results, and adjusting the action in the future if warranted.[4, 5]

Proposed adaptive management, monitoring, and performance measures are developed through literature reviews and FWC staff meetings. Overall, a results-based approach is incorporated into the Management Plan, for which effective monitoring is an integral component. The FWC will monitor conservation actions, species, habitats, and major threats to the conservation of the natural and cultural resources of the SRWEA.

4.2.1 Monitoring

A well-developed monitoring protocol is also one of the required criteria for the management of the SRWEA. Monitoring and performance measures are important but often overlooked elements

of conservation planning. Monitoring provides the critical link between implementing conservation actions and revising management goals.

Monitoring is the systematic, repeated measurement of environmental characteristics to detect changes, and particularly trends, in those characteristics. Monitoring provides the essential data for evaluating the costs, benefits, and effectiveness of planned conservation actions, whereby those evaluations can then be used to modify management actions as necessary to meet longer-term management goals.[3]

For natural communities, monitoring protocols are established through the FWC's Objective Based Vegetation Management (OBVM) program which monitors how specific vegetative attributes are responding to FWC management (Section 4.3.1). For imperiled and locally important fish and wildlife species, monitoring protocols are established through the FWC's Wildlife Conservation Prioritization and Recovery (WCPR) program (Section 4.4.1). FWC staff may also monitor additional fish and wildlife species when deemed appropriate. Volunteer opportunities that support community engagement and the goals and objectives of the SRWEA may be developed in collaboration with land managers, key biologists, and/or partners and could include projects ranging in focus from single-day events like bioblitzes and trash cleanups to longer term programs assisting in species monitoring, trail maintenance, and habitat management. Invasive plant and animal species are also monitored as needed and appropriate (Section 4.5). Recreational uses are monitored through the FWC's Public Access Services Office and work in conjunction with the establishment and adjustment of public access carrying capacities (Section 4.6.3). Cultural resources are monitored with guidance from the DHR (Section 4.9).

4.2.2 Florida Landscape Assessment Model

The FWC has developed the Florida Landscape Assessment Model (FLAM) as a GIS-based assessment tool that incorporates a wide variety of landscape and wildlife species data. The FLAM evaluates the Florida landscape based upon important natural resources and habitat needs of wildlife to identify ecologically significant lands in the state and to assess the potential impacts of management and land-use changes. The FLAM was developed to provide technical assistance to various local, regional, state, and federal agencies and entities interested in wildlife needs and conservation to: (1) determine ways to avoid or minimize project impacts by evaluating alternative placements, alignments, and transportation corridors during early planning stages, (2) assess direct, secondary, and cumulative impacts to habitat and wildlife resources, and (3) identify appropriate parcels for public land acquisition for wetland and upland habitat mitigation purposes. The FLAM ranks habitat from a 0-10; a rank of 10 being of greatest value. The FLAM (2021) indicates that the SRWEA has a very high mean wildlife value of 8.9 (Figure 11).

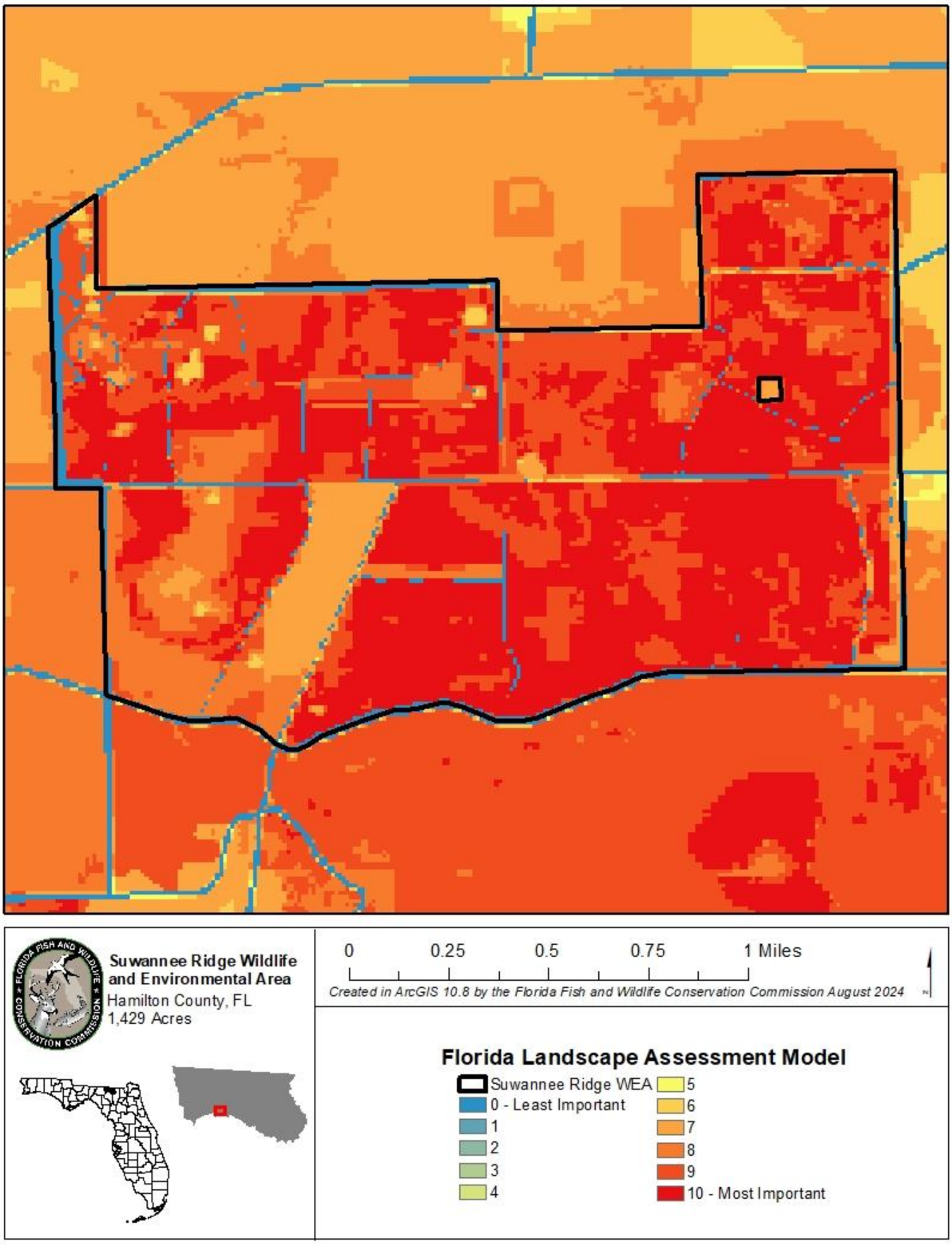


Figure 11. Florida Landscape Assessment Model

4.2.3 Performance Measures

Performance measures include qualitative or quantitative measures used to provide an estimate or index of the characteristic of interest and to chart the overall progress of conservation actions towards specific goals. Successful monitoring programs and their associated performance measures provide natural resource professionals with valuable feedback on the effectiveness of conservation actions and make it possible to implement a more flexible adaptive management approach. An adaptive management approach ultimately will be more efficient and effective when it tracks inputs, incorporates an effective monitoring program that integrates performance measures, and evaluates results against desired goals.

4.2.4 Implementation

The SRWEA Management Plan serves as the guiding framework to implement this adaptive management process. It serves as the underpinning for the integration of management programs (OBVM, WCPR, Public Access Assessments, etc.) underway to accomplish needed conservation actions that are planned to manage the natural resources of the SRWEA and resolve conservation threats to fish and wildlife and the habitats they occupy. Based on evaluations of project results, the conservation actions are revised as necessary, and the adaptive management process is repeated.

4.3 Habitat Restoration and Improvement

On the SRWEA, the FWC will focus on land management activities, services, and projects that support or restore native habitat diversity, emphasizing maintenance of natural communities and restoration of disturbed areas. The SRWEA has functioning natural communities including sandhill, upland pine, and upland mixed hardwood that the FWC will continue to manage and protect. On any disturbed upland sites, the FWC intends to continue natural community restoration. Restoration may be achieved on disturbed areas by the reintroduction of fire, the restoration of historic hydrological conditions, and/or the use of mechanical or chemical forest management techniques as appropriate.

4.3.1 Objective-Based Vegetation Management

The FWC uses a comprehensive resource management approach to improving FWC-managed areas. OBVM is a monitoring tool used by the FWC to monitor how specific structural vegetative attributes that characterize a natural community are responding to management.

The first step in implementing OBVM is to map the current, and in most cases the historic, natural communities on the managed area using the FNAI Guide to the Natural Communities of Florida. The FWC contracts with FNAI to provide these mapping services and will recertify natural community maps for most areas on a five-year basis.

FNAI has mapped the current and historic natural communities on the SRWEA. The most recent natural community map update was completed in 2023. New acquisitions that occur will be mapped for natural communities and altered land cover types during this planning period.

After natural communities have been mapped, FWC land managers identify those natural communities that will influence and guide management decisions, known as the actively managed natural communities. The actively managed natural community being monitored at the SRWEA is sandhill. Through OBVM monitoring, the FWC collects data on 12 specific structural attributes that are then compared to FNAI established desired future conditions (DFC) for each natural community. The DFCs are generally based on structural vegetation attributes collected from reference sites that were deemed to be a high-quality and functioning example of the natural community being monitored and used for comparison purposes.

Overall, natural community mapping, OBVM structural sampling, and plant species lists provide FWC staff with data indicating natural community structure, distribution, and condition on the area. Comparing the monitoring results to DFCs provides important information on the structural condition and composition of a natural community at a given point in time. OBVM sampling is repeated every five years and comparisons with past OBVM monitoring data allows changes over time to be evaluated. This information is then used to guide and prioritize management efforts.

4.3.2 Prescribed Burning and Fire Management

The FWC employs a fire management regime to maintain or increase both species and habitat diversity and will continue a prescribed burning program on the SRWEA in accordance with natural community management objectives. Employing a burning program with different fire frequencies of two to three years, intensities, and seasonality (dormant season vs. growing season) of prescribed burns creates habitat diversity and a mosaic of vegetation patterns. This mosaic landscape will have characteristics of both frequently and infrequently burned areas, benefiting the greatest suite of flora and fauna.

An area-specific Prescribed Burn Plan has been developed and implemented (Appendix 11.13). This plan includes, but is not limited to, delineation of management units, descriptions of prescribed fire methodology, safety, and smoke management guidelines. As further outlined in the area's Prescribed Burn Plan, the FWC plans to continue to conduct prescribed burning on the area's fire adapted communities, with a goal to bring 100% of the area being maintained within the recommended fire return intervals during this planning period. Challenges that continue to impact the implementation of prescribed fire are described further in Section 6. The continuing benefits of prescribed fire on the area's wildlife habitats, along with other ongoing habitat restoration activities that are being implemented, are described in more detail in Section 4.3.3.

4.3.3 Habitat Restoration and Improvement Activities and Accomplishments

Significant habitat management activities have taken place within many of the natural communities and altered land cover types over the course of the previous management period beginning in 2015. As stated previously, all management units with fire-adapted natural communities will continue to be treated with prescribed fire, most on a repeated basis as established within the Prescribed Burn Plan. This has aided in the improvement and restoration of native groundcover and wildlife habitat throughout the SRWEA. The following is a list of the primary habitat restoration and improvement activities that have occurred within the previous planning cycle, beginning in 2015:

- Prescribed Burn Plan updated in 2025.
- 1,297 acres of the area's fire adapted communities have been treated with prescribed fire.
- 139 acres have been mechanically treated with mowing.
- Native nuisance species have been treated with herbicide on approximately 210 acres of sandhill to further improve conditions. Species include mature oaks (*Quercus* sp.), sweetgum (*Liquidambar styraciflua*), black cherry (*Prunus serotina*), and other native nuisance species.

Continuing habitat management activities will focus on enhancing natural communities, maintaining recommended fire return intervals for fire adapted communities, treating and removing invasive plant species, and controlling vegetation through mowing and roller chopping as needed. Invasive species control is more extensively discussed in Sections 4.5 and 5.4. Further specific habitat management and improvement objectives planned for the SRWEA are described in Section 5.

4.4 Fish and Wildlife Management, Enhancement, and Population Restoration

Across the SRWEA, the natural communities create a mosaic that supports a wide variety of fish and wildlife species, including imperiled, game, and non-game species. The FWC uses the term "locally important species" to encompass imperiled species, as well as a select group of common species, that occur on the area and can help guide management activities. By managing the area's natural communities for locally important species, the area will benefit a host of other species that use these natural communities. To support this goal, the FWC emphasizes conservation, protection, and management of natural communities to protect and enhance populations of fish and wildlife found on the SRWEA. Natural communities vital to locally important species include sandhill, upland pine, and upland mixed hardwood.

To guide species management on FWC-managed lands, the FWC takes a proactive, science-based approach in conjunction with input from species experts and individuals with knowledge of the area. Management practices are designed to restore, enhance, or maintain natural communities with an emphasis on the needs of locally important species. Locally important species (resident and migratory) will be managed for optimum richness, diversity, and abundance. This will be further augmented by following approved Federal and FWC Species Recovery Plans, guidelines, and other scientific recommendations for these species. Guided by these recommendations, land management activities including prescribed burning and timber stand improvements will further address locally important species requirements and habitat needs.

For locally important species population monitoring, the FWC takes a tiered approach. Using taxa inventory monitoring and opportunistic observations, staff identify which species occur on the SRWEA and track diversity through time. In addition, when appropriate, staff monitor specific species to track population status. Wildlife experts help to identify the best monitoring approach for the area to inform how the management is influencing the populations. Using this tiered monitoring approach, the FWC will gather information about the species using the area and how select species are responding to management. Section 5.2 and Appendix 11.14 provide further

information on FWC's comprehensive species management strategy for all locally important wildlife and their respective habitats.

4.4.1 Locally Important Species: Wildlife Conservation Prioritization and Recovery

The FWC has identified the need to: 1) demonstrate optimal wildlife habitat conservation on FWC-managed lands; 2) develop science-based performance measures to evaluate management; 3) recover imperiled species; and 4) prevent future imperilment of declining wildlife species. To help meet these needs, the FWC uses a comprehensive resource management approach to maintain FWC-managed areas. Restoring the form and function of Florida's natural communities is the foundation of this management philosophy. The FWC uses OBVM to monitor how specific vegetative parameters are responding to management and uses the WCPR program to ensure management is having the desired effect on wildlife.

The WCPR program helps assess locally important wildlife species' needs and opportunities, prioritize what the FWC does for locally important species, prescribe management actions to aid in species recovery, prescribe monitoring to allow evaluation of the species' response to management, and ensure the information is shared with others. To determine specific management and monitoring actions needed for each species, the FWC considers the species' status on the area; the current condition of the area's natural communities; the amount and spatial arrangement of the species' potential habitat on the area and adjacent lands; the species' response to management; and any local overriding factors (e.g., status of species in the region, local declines, or extirpations). Staff then combine these assessments with area-specific management considerations to develop a WCPR Strategy for the area (Appendix 11.14). Each area-specific Strategy prescribes management actions to achieve and identifies monitoring to verify progress towards meeting desired outcomes. By providing FWC managers with information on actions they should undertake, the FWC intends for the Strategy to assure the presence and persistence of Florida's native wildlife.

Through the actions of this program, the FWC facilitates fulfilling the needs of locally important wildlife species. In the long-term, by implementing the WCPR Strategies on FWC-managed lands and continuing to assess wildlife species' needs, the FWC will continue to play an integral role in aiding the recovery of locally important species and preventing the future imperilment of declining wildlife species.

4.4.2 Game Populations

The FWC intends to manage game populations on a sustained-yield basis to assure healthy game populations and a high-quality recreational experience. In general, game populations will be managed to provide continued recreational sport hunting and wildlife watching opportunities. However, some of the hunting opportunities may be regulated through a limited entry hunt program to ensure the persistence of viable game species populations, as well as hunter safety and satisfaction. The potential for conflicts among recreational activities and user groups will also be considered and continually monitored.

4.4.3 Nuisance Animal Behavior

The FWC also works to address nuisance animal behavior on the SRWEA. The FWC will continue to monitor impacts of nuisance animal behavior on the area and implement mitigation strategies as needed and appropriate.

4.4.4 Fish and Wildlife Management Activities and Accomplishments

During the previous planning period, the FWC conducted monitoring activities for a variety of locally important species. Locally important species projects will continue to be implemented in accordance with the WCPR Strategy. In addition to locally important species activities, the FWC will continue to monitor and manage for game and nuisance animal species. Following is a list of activities and monitoring outcomes that have within the previous planning cycle, beginning in 2015, to further FWC's mission for managing fish and wildlife on the SRWEA.

- The gopher tortoise population was sampled via the Line Transect Distance Sampling (LTDS) protocol during Fiscal Years 2016/2017 and 2021/2022. Results from the 2016/2017 survey estimated population densities to be 0.73 gopher tortoises/acre, while the 2021/2022 survey estimated population densities to be 0.75 gopher tortoises/acre.
- FWC staff conducted inventory-style monitoring for avian species in FY 2021/2022, mesomammal species in 2023/2024, and bat species in 2024/2025.
- FWC staff monitored Bachman's sparrow (*Peucaea aestivalis*) and brown-headed nuthatch (*Sitta pusilla*) populations on the SRWEA because presence of these species indicates high quality, fire-maintained, mature pine habitat. Both species were documented on the SRWEA with surveys conducted from 2015-2022 and 2025.
- FWC staff maintained six nest boxes for wood ducks (*Aix sponsa*) annually on the SRWEA.

4.5 Non-native Species Maintenance and Control

With invasive species populations continuing to grow in Florida, the FWC takes a proactive and comprehensive approach to the monitoring and management of non-native plants and animals, as well as pests and pathogens, on FWC-managed areas. Non-native species are those species that do not originate from Florida. These species are often introduced because of human activities and are closely monitored by the FWC for potential future impacts. If a non-native species is found to cause or is likely to cause environmental or economic harm to humans, it is classified as an invasive, as such the Plan uses the term "invasive" where appropriate. On the SRWEA, the FWC has established a variety of control measures for the management of any non-native plant and animal species found, as further outlined in Section 5.4 of this Management Plan.

4.5.1 Non-native Plant Species

The FWC will continue efforts to control the establishment and spread of FISC Category I and II plants while using the most current control technologies (CCT) which may include mechanical, herbicide, and biological control. Treatments utilizing herbicides will comply with instructions found on the herbicide label and employ the Best Management Practices and CCT for their application. More information regarding herbicides used on FWC's lead managed areas can be found here.

During the previous planning period, several control activities have occurred (Section 4.5.3). Herbaceous and weakly woody species can be particularly challenging. This group is diverse and includes species such as mimosa (*Albizia julibrissin*), cogongrass (*Imperata cylindrica*), Japanese climbing fern (*Lygodium japonicum*), chinaberry (*Melia azedarach*), and Chinese tallow (*Triadica sebifera*). The rotation intervals can vary from treatments once every two- to three-years, to annual treatments, to as many as four treatments in a growing season depending on the species. For this reason, rotation intervals for these species should be developed in coordination with the FWC's Invasive Plant Management Section. Infestations requiring multiple treatments in a growing season should also be mapped individually, because their treatment plans may differ from the rest of the invasive plants in any given unit.

Treatment strategies for invasive plants will be adjusted over time as conditions change on the SRWEA. Changes may include hydrological restoration, wildfire, and reintroduction of endangered plant/animal species.

Additionally, the FWC will continue efforts to control the introduction of non-native species, as well as pests and pathogens, on the SRWEA by requiring all personnel, both contracted and internal, to follow the FWC Decontamination Protocol. The SRWEA has a designated site which can be used for decontamination of both equipment and personnel to allow for a proactive approach to controlling new introductions. FWC area staff will continue to work closely with FWC's Invasive Plant Management Section for guidance and assistance on treatments and management of invasive species on the area.

4.5.2 Non-native Fish and Wildlife Species

The FWC continues to work towards minimizing the adverse impacts of non-native fish and wildlife species in Florida. A non-native species may be considered invasive if it causes or is likely to cause adverse impacts to Florida's ecology, economy or human health and safety. Minimizing adverse impacts is accomplished through prevention, early detection, rapid response, control and management, and education and outreach. Early detection and rapid response are a critical defense against the establishment of non-native fish and wildlife. The FWC monitors and removes these species, responds to new invasions, and continues to assess the risk of species not yet present in our state. Rule 68-5, F.A.C., Federal Lacey Act, and certain F.S. govern the importation, possession, and use of invasive fish and wildlife. Rule 68-5, F.A.C., identifies Conditional and Prohibited invasive species in Florida. More information on these regulations can be found here and the rule may be found here. Conditional species (formerly referred to as restricted species) and Prohibited species are dangerous to Florida's native species and habitats and could pose threats to health and welfare of the people of Florida or the economy. The FWC relies on monitoring efforts and current science including risk determination, supplemental documentation, and research to identify possible invasive species. To further assist the FWC's effort on non-native fish and wildlife identification and removal, the FWC encourages the public to utilize the FWC's Invasive Species Hotline at 888-Ive-Got1 (483-4681) or report observations of non-native species here. More information on these public reporting options and other components of the Wildlife Impact Management Section's Nonnative Fish and Wildlife Program can be found here.

To address the presence of non-native fish and wildlife on the SRWEA, FWC area staff will continue to work closely with FWC's Wildlife Impact Management Section for guidance and assistance. The FWC also relies on public assistance and participation in the control of non-native fish and wildlife species. Executive order 23-16 authorizes the lethal take and removal of non-native reptiles on 32 FWC-managed lands. Trappers and nuisance wildlife control operators can also apply for an eradication and control permit to assist in the capture of Prohibited species on private and public lands including wildlife management areas. More information on this permit process can be found here. Due to the growing concern related to the impacts of several invasive species, the FWC and partners take a proactive and coordinated approach towards the removal of these harmful non-native species.

An invasive animal of concern throughout the state and on the SRWEA is the wild hog. These animals have high reproductive rates, and when populations reach high densities, wild hogs can significantly degrade natural communities through foraging activity (rooting). The FWC will consult with other regional natural resource managing agencies and private landowners to coordinate wild hog control measures as necessary.

4.5.3 Non-native Activities and Accomplishments

Invasive plant species known to occur include mimosa, cogongrass, Japanese climbing fern, chinaberry, and Chinese tallow (Table 5). During the previous planning period, FWC staff worked to survey and control non-native plant and wildlife species. Following is a list of activities the FWC accomplished during the last planning period as well as activities that are still ongoing. Non-native species objectives and challenges for the SRWEA for the next 10 years are further detailed in Sections 5 and 6.

- 1,297 acres have been placed into maintenance rotation.
- All of the SRWEA (100%) is considered as having achieved maintenance rotation.

4.6 Public Access and Recreational Opportunities

To facilitate wildlife-focused outdoor recreational opportunities on the area, the FWC has continued to establish and maintain hiking trails, entrance signs, and a kiosk (Figure 10). In addition to recreational opportunities on the SRWEA, the FWC offers a variety of recreation and environmental education programs throughout the state. The FWC has several summer camp locations that provide programming on the theme of conservation-centered recreation. The FWC also hosts events that encourage Florida residents and visitors to get outdoors and enjoy the WMA system. For more information on the numerous recreation opportunities the FWC offers on all areas visit MyFWC.com/Recreation.

Further planned public access, recreational, and educational opportunities on the area are detailed in Section 5. Ongoing public access and recreational opportunity management challenges are addressed in Section 6.

4.6.1 Americans with Disabilities Act

When public facilities are developed on areas managed by the FWC, every effort is made to comply with the Americans with Disabilities Act (ADA) (Public Law 101-336). As new facilities are developed, the universal access requirements of this law are followed in all cases except where the law allows reasonable exceptions. Recreation facilities in semi-primitive or primitive zones will be planned to be universally accessible to the degree possible except as allowed by the ADA[6] where:

1. Compliance will cause harm to historical resources or significant natural features and their characteristics.
2. Compliance will substantially alter the nature of the setting and therefore the purpose of the facility.
3. Compliance would not be feasible due to terrain or prevailing construction practices.
4. Compliance would require construction methods or materials prohibited by federal or state statutes or local regulations.

4.6.2 Public Access Assessments

The FWC has adopted a comprehensive approach to the planning and administration of fish and wildlife-focused public outdoor recreational opportunities for the SRWEA. To accomplish this, the FWC will develop a Public Access Assessment for the SRWEA that will be used to further guide the design and development of appropriate infrastructure and interpretive materials that will support the recreational use of the area by the public. This Public Access Assessment will include information on local area demographics, natural features, and wildlife characteristics of the SRWEA that contribute to high-quality sustainable outdoor recreation experiences, assessment of current infrastructure, volunteer program opportunities, and interpretive themes.

4.6.3 Public Access Carrying Capacity

Baseline carrying capacities for users on the FWC-managed lands are established by conducting a site-specific sensitivity analysis using available data for the site. The intent of the carrying capacity analysis is to minimize wildlife and habitat disturbance and provide the experience of being “immersed in nature” that visitors to the FWC-managed areas desire. Carrying capacities are just a first step; management of recreational use requires a means of monitoring visitor impacts. Responding to these impacts may require adjusting the carrying capacities as necessary. The carrying capacities generated through this process are used as a tool to help plan fish and wildlife-focused public outdoor recreation opportunities. Based on an analysis of the overall approved uses and supported public access user opportunities and the anticipated proportional visitation levels of the various user groups, the FWC has determined that the SRWEA can currently support 24 visitors per day. It is important to note that public access carrying capacities are not developed to serve as a goal for expanding the public use of a particular area to match the established carrying capacity. Rather, they are developed to establish maximum thresholds for public use of the respective area to protect the natural and cultural resources and to ensure that visitors will have a high-quality visitor experience while minimizing impacts to environmentally sensitive communities. The public access carrying capacity will be periodically reevaluated, and additional capacity may be contemplated.

4.6.4 Public Access and Recreational Activities and Accomplishments

During the previous 10-year planning period, the FWC completed the following public access and recreational improvements and enhancements on the SRWEA:

- A new trail guide was developed.
- In coordination with Hamilton County, approach signs on CR 249 were installed.

4.7 Hydrological Preservation and Restoration

A Hydrological Assessment and Conceptual Restoration Plan was completed on the SRWEA in 2017 (Appendix 11.16). FWC staff will work towards implementing hydrological restoration and improvement activities as recommended by the area's assessment. Some recommendations may not be feasible during this planning period due to funding and potential adjacent land impacts. However, during this planning period, staff will work to improve and repair existing culverts and low water crossings, as well as install new culverts or low water crossings, as appropriate.

Currently, staff continue to communicate and collaborate as needed with the SRWMD and the DEP on any ground or surface water quality or quantity monitoring and any needed monitoring protocols. In this capacity, the FWC will primarily rely on the expertise of the SRWMD and the DEP to facilitate these monitoring activities as needed. If necessary, the FWC may independently conduct, or contract for, water resource monitoring on the SRWEA, as guided by the DEP and the SRWMD.

4.7.1 Hydrological Preservation and Restoration Activities and Accomplishments

During the previous 10-year planning period, the FWC completed a Hydrological Assessment and Conceptual Restoration Plan for the SRWEA (2017).

4.8 Forest Resource Management

A Forest Management Plan for the SRWEA was developed by a vendor, The Forestry Company, in 2021 (Appendix 11.15). The management of timber resources will be considered in the context of the Forest Management Plan and the overall land management goals and activities.

Pursuant to OBVM management goals, the FWC will continue to manage timber resources for wildlife benefits and natural community restoration. Management activities, including the use of timber thinning and harvesting, may be utilized. The primary management technique for encouraging reforestation is the protection of young trees and seedlings on these sites from damage. However, where natural regeneration is lacking, artificial reforestation may be implemented. Planting trees on these selected sites is used to increase the rate of reforestation and to ensure diversity. Forested wetlands are managed for stands with old growth characteristics. Snags, when possible, will be protected to benefit cavity-nesting species.

4.8.1 Forest Resource Management Activities and Accomplishments

During the previous 10-year planning period, the FWC completed several forest resource management activities on the SRWEA, including:

- A Forest Management Plan was completed in 2021.

- Approximately 251 acres of timber were harvested.
- Longleaf pine planting was completed on approximately 205 acres.

4.9 Cultural Resources

A review of the FMSF indicates that nine cultural resources have been recorded on the SRWEA (Section 2.8). Additionally, one cultural resource survey has been conducted on the area. In cooperation with the DHR, the FWC will continue to monitor and report on all recorded sites annually.

The FWC will consult with the DHR to determine the procedures necessary to identify, assess, and preserve any unrecorded or unevaluated cultural resources that may be present within the SRWEA. In addition, the FWC will ensure area management staff have the latest DHR Archaeological Resource Management (ARM) training. The FWC will follow the DHR's *Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties*, and, in accordance with Sections 267.061(2)(a,b), F.S., the FWC will consult with and allow the DHR a reasonable opportunity to comment prior to any undertaking that may impact historic properties. Furthermore, should any previously unidentified resources be located on the SRWEA, the FWC will prepare and submit all necessary documentation to the FMSF.

4.9.1 Cultural Resource Management Activities and Accomplishments

During the previous planning period, a cultural resource survey was conducted by DHR, where they found nine cultural resources on the SRWEA, and one historical cemetery on the only inholding within the SRWEA.

4.10 Capital Facilities and Infrastructure

The FWC's land management philosophy is designed to conserve the maximum amount of wildlife habitat while providing the minimal number of capital facilities and infrastructure necessary to effectively conduct operational and resource management activities and provide ample opportunities for fish and wildlife-focused public outdoor recreation. For these reasons, planned capital facilities and infrastructure will focus on improving access, recreational potential, hydrology, or other resource and operational management objectives.

Current capital facilities and infrastructure on the SRWEA include a kiosk and two sheds. As described in Section 4.6.1 of this Management Plan, for any public facilities that are developed on areas managed by the FWC, every effort is made to comply with the ADA Act (Public Law 101-336). Maintenance and improvement activities of current and future capital facilities are further outlined in Section 5.9.

4.10.1 Capital Facilities and Infrastructure Activities and Accomplishments

During the previous 10-year planning period, the FWC constructed two sheds for equipment storage.

4.11 Land Conservation and Stewardship Partnerships

Land conservation and stewardship partnerships can lead to a resilient and adaptive landscape and economy that can support future generations of Florida. Thriving landscapes and habitats produce a range of benefits such as protecting our water and air, mitigating climate change, and providing habitat for fish, wildlife, and plants. In addition, productive landscapes power local and regional economies by supporting sustainable activities including fishing, farming, ranching, forestry, recreation, and tourism. Maintaining these benefits as Florida is facing ever-increasing significant land and water issues is paramount. Population growth, habitat loss and fragmentation, land use changes, invasive species, water crises, and climate change can threaten Florida's future. To successfully manage these challenges for the long term, there is a growing need for conservation work to be done at a larger scale and with multiple partners that can pool their resources and incorporate best scientific practices.

4.11.1 Decision Support Tools

Florida Conservation Blueprint

The Florida Conservation Blueprint (Blueprint) is a spatial plan that identifies shared conservation priorities across Florida. The Blueprint was developed by the Peninsular Florida Landscape Conservation Cooperative for the cooperative incorporation of strategies from a suite of partners. The Blueprint supports spatial conservation planning to inform conservation actions and investment. The Blueprint provides planners and managers across organizations the opportunity to align their efforts to protect fish and wildlife habitat, improve quality of life for people, and develop strong economies. The Blueprint can be accessed from the Florida Conservation Planning Atlas. The FWC uses the Blueprint to help guide and prioritize landscape conservation actions and acquisition opportunities (Figure 12).

Other Decision Support Tools

There are additional data and tools that have been developed as decision support tools for identifying and prioritizing areas for conservation action as well as to guide resource (i.e., time, staff, and funding) allocation. These tools include, but are not limited to, FLAM (Section 4.2.2), Critical Lands and Water Identification project, the Florida Ecological Greenways Network, FNAI element occurrences database, Simple Map Viewer, Fire Map Viewer, Florida Springs Dashboard, Climate Adaptation Explorer, and the Florida Ecological Report Cards. Tools and supporting data can be found at www.FNAI.org or on the Florida Conservation Planning Atlas.

4.11.2 Conservation Stewardship and Partnership Opportunities

Private Lands Partnerships

The FWC recognizes the interconnected needs of protecting and enhancing private property values and rights and creating new markets and economies that support the conservation value of private working lands. Private landowners seeking assistance with habitat management will likely find it offered within the FWC Landowner Assistance Program (LAP). The FWC LAP program provides many opportunities for conservation minded landowners to obtain assistance and advice from FWC staff and programs for improving land conservation practices on their lands.

The LAP routinely conducts workshops for interested landowners to interact with FWC staff and learn how they may participate in the program. The FWC employs biologists who are available to provide wildlife-related assistance with land use planning and habitat management. In addition, the LAP works with landowners to enroll in the NRCS conservation cost-share programs to assist with implementation of wildlife friendly practices. There are many forms of assistance that include technical, financial, and educational and various forms of recognition that seek to award landowners who manage their wildlife habitat responsibly. At the time of the plan development, no specific land stewardship workshops had been conducted for landowners adjacent to the SRWEA. The FWC will continue to evaluate the level of interest and efficacy of providing technical assistance to adjacent private landowners to enhance the conservation management of their lands. More information on the FWC's LAP program and online habitat management tools is available online.

Landscape Conservation Partnerships

The FWC will continue to work with partners including government entities, private organizations, and academic institutions on collaborative landscape conservation efforts and acquisition opportunities. Potential partners for the SRWEA and surrounding areas include the SRWMD, the Florida Forest Service (FFS), USFWS, Hamilton County, the DEP, Conservation Florida, Alachua Conservation Trust, and other organizations and potential grant program opportunities. The FWC will continue to commit staff time and other resources to regularly providing information to partners regarding landscape conservation science, opportunities, and progress.

4.11.3 Land Acquisition

Using identified tools outlined previously, the FWC works to identify lands within or adjacent to FWC-managed areas that are important for the conservation of fish and wildlife, serve as a link or corridor to other publicly owned property, enhance the protection or management of the property, create a more manageable boundary configuration, or have a high resource value that would otherwise be unprotected. Preservation of these lands can be accomplished through fee-simple or less-than-fee acquisition. The FWC works to pursue these opportunities through the FWC Additions and Inholdings Acquisition program, supporting Board of Trustees acquisition and addition of lands within the Florida Forever program and continued partnership with other agencies and private organizations on acquisition of identified lands. During the previous 10-year planning period, the FWC has worked to advance landscape conservation partnerships and pursue potential acquisition opportunities.

Less-Than-Fee Acquisition

Less-than-fee acquisitions, also known as conservation easements, are voluntary agreements between a landowner and government agency or conservation organization that acquires certain rights to a landowner's property for long-term conservation of the land, while the landowner still retains ownership of their property. The agreement is designed for landowners to continue to manage their land to maintain a working landscape in a manner that also enhances the conservation benefits provided by their land. These voluntary agreements to conserve land support the goals of landscape conservation. Less-than-fee acquisition is not only a means of conserving land but is also a cost-effective means for governmental and non-governmental

organizations to protect land, while also providing economic and tax benefits to the landowner and local economy.

Fee-Simple Acquisition

Fee-simple acquisition is the process of acquiring complete ownership of the land. Fee-simple acquisition can be accomplished through the Florida Forever program or through grant programs and acquisition partnerships. The Florida Forever program is a land acquisition program with the purpose of conserving natural and cultural resources throughout the state. The DEP, as staff to the Board of Trustees, oversees the program. The Florida Forever program replaced the Preservation 2000 program, and since these programs' inception, nearly three million acres have been conserved throughout the state.

FWC's Additions and Inholdings Acquisition Program

Per 18-2.021, F.A.C., the FWC identifies parcels located directly in or adjacent to the subject area which can be recommended for acquisition through the FWC Additions and Inholdings Acquisition program. Properties totaling to about 4,350 acres have been identified for recommended acquisition under the auspices of the FWC's Additions and Inholdings Acquisition program for the SRWEA (Figure 13). Consistent with Florida Forever program criteria, parcels on the list have been ranked High, Medium, or Low priority based on a score generated by a GIS-based resource evaluation model, along with technical input from FWC staff. The order of acquisition priority may be changed as necessary based on factors including available funding necessary to complete a particular acquisition project, changing development pressures, landowner willingness, funding partnerships, unique acquisition opportunities like bargain sales (less than 80% of appraised value), and donations.

The FWC Additions and Inholdings Acquisition List is updated through time, thus staying up to date for land ownerships, County parcel records, land conservation opportunities, and evolving management challenges. The FWC frequently analyzes, evaluates, and prioritizes its recommended conservation actions in a systematic, comprehensive, and consistent manner over time. Currently, the FWC often recommends fee-simple acquisition of the lands on the FWC Additions and Inholdings Acquisition List for the SRWEA to optimize the conservation of fish and wildlife, public access and use, and overall resource and operational management of the area. However, as mentioned previously, the FWC may also pursue less-than-fee acquisition with adjacent landowners, though it should be noted that landowner preference is often the key element in determining whether to pursue a fee-simple or less-than-fee acquisition.

Parcels on the FWC Additions and Inholdings Acquisition List will be acquired if possible, according to their priority ranking for acquisition, as funding availability allows, and based on the landowner's willingness to sell their lands. Participation in any FWC acquisition is entirely voluntary and at the sole discretion of willing landowners. The FWC also continues to assist and support the DEP/Board of Trustees in the acquisition or recommend acquisition of the remaining lands within nearby Florida Forever projects as essential to the long-term conservation of wildlife and other elements important to the ecosystem functions.

Alternative Options

Along with the several land acquisition options described previously, alternative land protection methods are also available. The state accepts donations of land, life estate, and first-right-of-refusal. Life estate is an alternative that allows a landowner to reside on their property during their lifetime, however, ensures state ownership after passing. Additionally, there is also the option that a landowner could offer the state a first-right-of-refusal. After a first offer is denied by a landowner, the first-right-of-refusal option provides the state with a chance to purchase the land in the future. The state offers several alternative possibilities to obtaining the rights and/or ownership to land for conservation purposes, which furthers conversation-based goals and objectives for Florida's future.

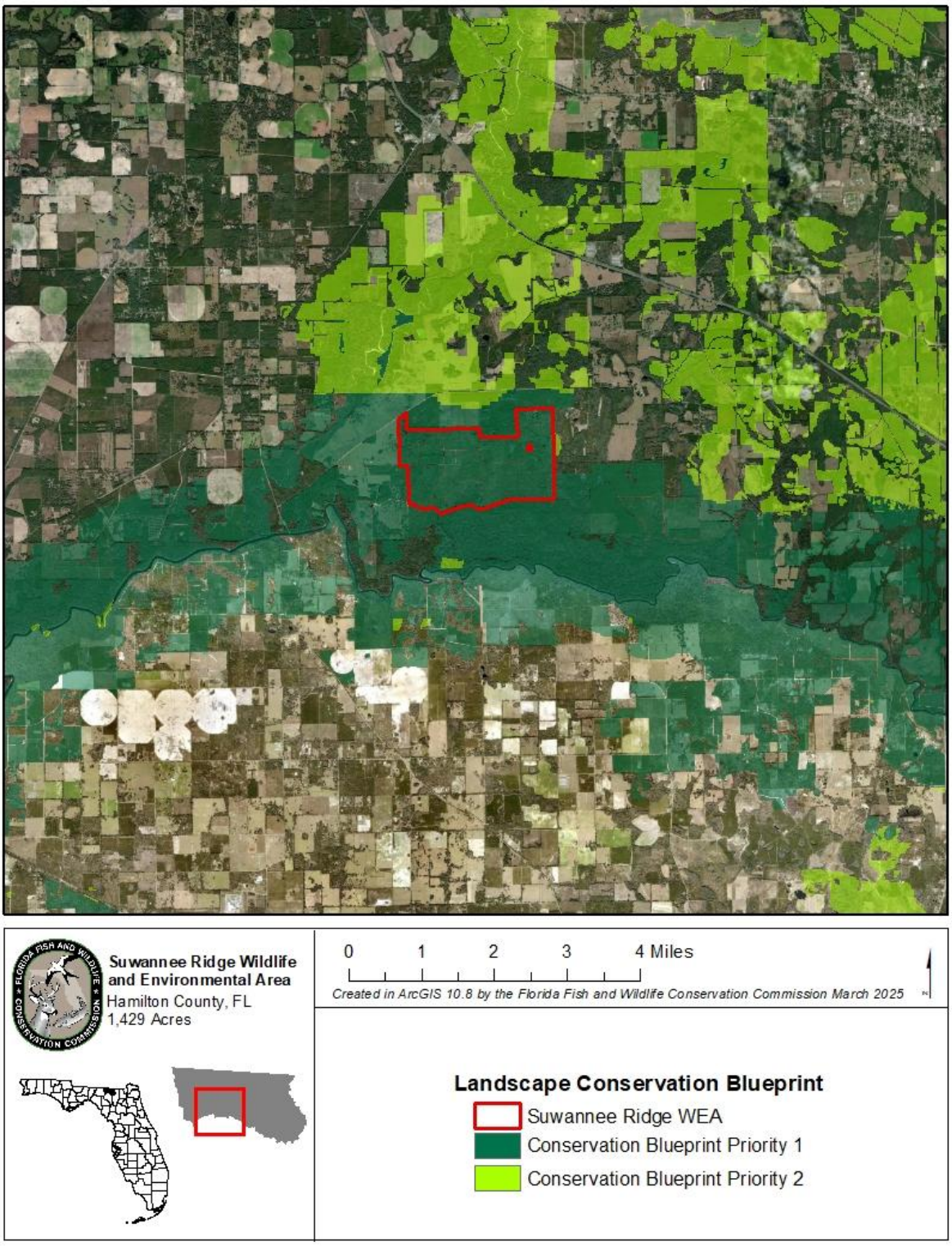


Figure 12. Landscape Conservation Blueprint

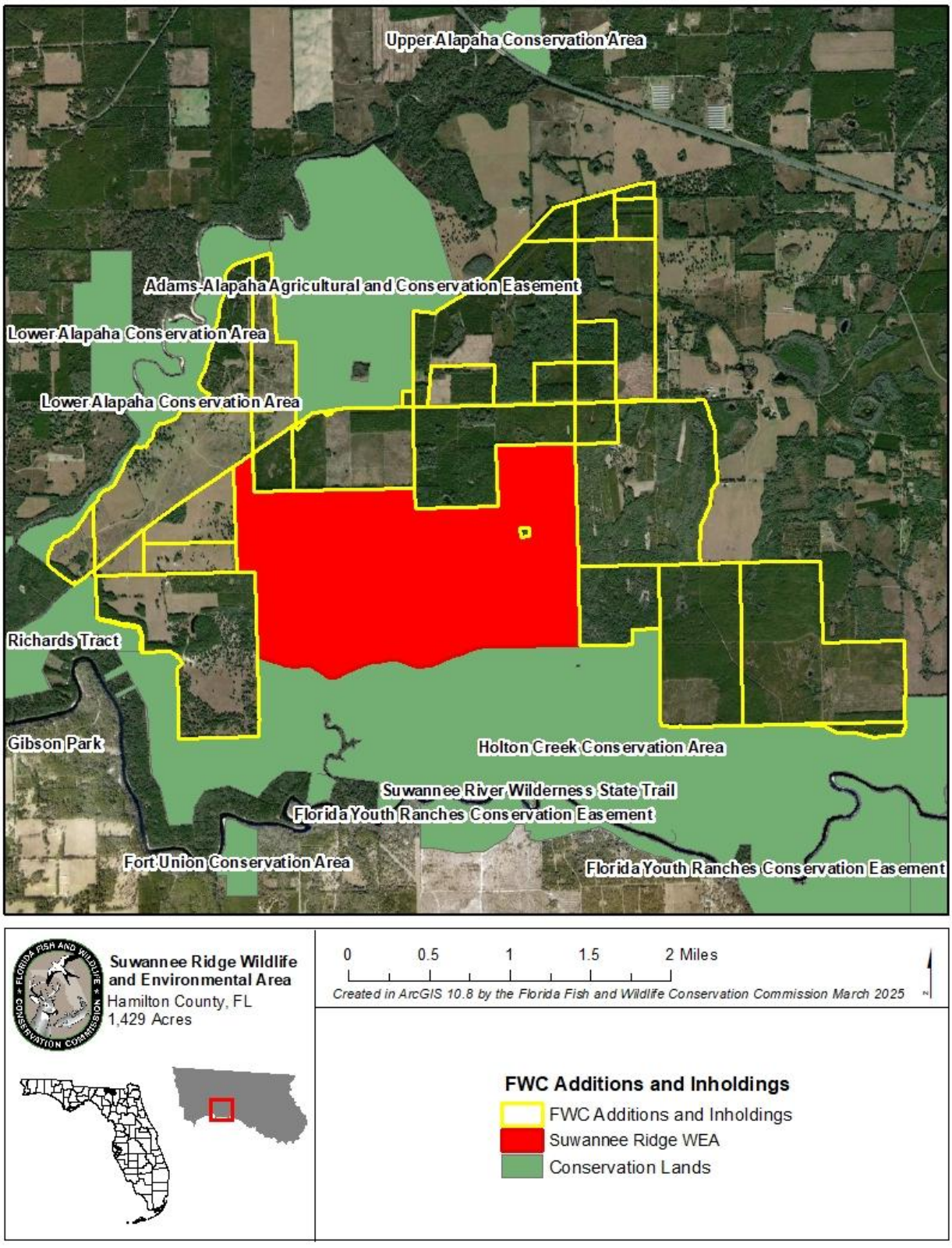


Figure 13. FWC Additions and Inholdings

4.12 Research Opportunities

The FWC intends to cooperate with researchers, universities, and others as feasible and appropriate. For the SRWEA, the FWC will continue to assess and identify research and environmental education partnership opportunities as appropriate. Research proposals involving the use of the area are evaluated on an individual basis. All research activities must have prior approval by the FWC.

4.12.1 Research Opportunities Activities and Accomplishments

The SRWEA was a study site for a 2017-19 study of Florida pine snake (*Pituophis melanoleucus mugitus*) habitat use, movements, and survival conducted by the FWC's Wildlife Diversity Conservation Section.

4.13 Cooperative Management and Special Uses

4.13.1 Cooperative Management

The FWC is responsible for the overall management and operation of the SRWEA, as set forth in the lease agreement with the Board of Trustees. In keeping with the lease agreement and conducting its management operations in the most effective and efficient manner, the FWC cooperates with other agencies to achieve management goals and objectives described in this Management Plan. These include cooperating with the DHR to ensure the requirements of the *Management Procedures Guidelines - Management of Archaeological and Historical Resources* document (Appendix 11.17) are followed regarding any ground-disturbing activities. In addition, the FWC cooperates and consults with the SRWMD and DEP for the monitoring and management of both ground and surface water resources and the overall management of the SRWEA.

4.13.2 First Responder and Military Training

First-responder (public governmental police department or agency, fire and emergency medical service personnel) training and military training are conditionally allowed on the SRWEA. Such activities are considered allowable uses only when undertaken intermittently for short periods of time and in a manner that does not impede the management and public use of the SRWEA and cause no measurable long-term impact to the natural resources of the area. Additionally, FWC staff must be notified and approve of the training through the issuance of a permit prior to any such training taking place on the SRWEA. Any first-responder or military training that is not low-impact, intermittent, and occasional would require an amendment to the Management Plan and therefore will be submitted by the FWC to the DSL and ARC for consideration prior to authorization.

4.13.3 Apiaries

Currently, there are no apiaries operating on the SRWEA. However, use of apiaries is conditionally approved for the SRWEA, so long as it is deemed to be consistent with purposes for acquisition, follows the Conceptual State Lands Management Plan, and is consistent with the FWC agency mission, goals, and objectives. Location, management, and administration of apiaries on the SRWEA will be guided by the FWC Division of Habitat and Species Conservation's Apiary Policy (Appendix 11.12).

4.14 Soil and Water Conservation

Soil disturbing activities will be confined to areas that have the least likelihood of experiencing erosion challenges. On areas that have been disturbed prior to acquisition, an assessment will be made to determine if soil erosion is occurring, and if so, appropriate measures will be implemented to stop or control the effects of this erosion. Water conservation is accomplished through hydrological restoration, management, and monitoring as described in Section 5.6.

5 Resource Management Goals and Objectives

The management goals and objectives described in this section are broad, enduring statements designed to guide the general direction of management actions aimed at achieving an overall desired future outcome for the SRWEA. The objectives listed within each management goal offer more specific management guidance and measures and are considered the necessary steps to be completed to accomplish the management goals. The objectives are classified as having either short-term (less than two years) or long-term (up to 10 years) timelines for completion.

5.1 Habitat Restoration and Improvement

Goal: Improve extant habitat and restore disturbed areas.

Long-term

1. Contract for recertification of current natural community mapping.
2. Utilize OBVM monitoring to evaluate actively managed natural communities and adjust management efforts to meet DFCs.
3. Continue to implement the Prescribed Burn Plan.
4. Continue to conduct habitat/natural community improvement including mowing and herbicide treatments as needed.

5.2 Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

Goal: Maintain, improve, or restore imperiled species populations and habitats.

Short-term

1. Conduct gopher tortoise LTDS.

Long-term

1. Continue to implement the WCPR Strategy by managing identified habitats and monitoring the area's populations of imperiled species.
2. Update the WCPR Strategy.
3. Conduct inventory monitoring surveys as needed to develop area-specific species lists.

5.3 Other Wildlife (Game and Non-game) Habitat Maintenance, Enhancement, Restoration, and Population Restoration.

Goal: Monitor, maintain, improve, or restore game and non-game species populations and habitats.

Long-term

1. Continue to monitor locally important wildlife species, as identified in the WCPR Strategy.
2. Continue to collect opportunistic wildlife occurrence data.
3. Continue collecting biological harvest data at the Holton Creek WMA check station.

5.4 Non-native Species Maintenance and Control

Goal: Remove non-native plants and animals and conduct needed maintenance and/or control.

Long-term

1. Monitor for the level of infestation of FISC Category I and Category II invasive plant species and treat, as needed and appropriate (Table 5).
2. Ensure that staff are familiar with the identification, reporting procedures, and control measures of high priority non-native wildlife species.
3. Continue to evaluate permit applications for control and research opportunities for non-native fish and wildlife species.

5.5 Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities.

Long-term

1. Develop a Public Access Assessment and update if new acquisitions or other factors warrant.
2. Continue to maintain 20.29 miles of trails including the improvement of 1.2 miles of marked trails.
3. Create a short trail connection between the marked hiking trail and the other area trails.
4. Maintain public access and recreational opportunities to allow for a recreational carrying capacity of 24 visitors per day.
5. Continue to provide a website, a kiosk, and a trail guide.
6. Incorporate the SRWEA in statewide interpretive/educational programs such as Florida WildQuest.
7. Assess the need for trailhead signage and design, produce, and install as necessary.
8. Continue to provide mobility-impaired hunting opportunities for game species.
9. Continue assessing and improving ADA accessibility for outdoor recreation.
10. Assess the existing trail route and modify as needed to improve sustainability.
11. Work with Hamilton County to install additional directional signage along the roads.

5.6 Hydrological Preservation and Restoration

Goal: Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition.

Long-term

1. Continue to maintain and enhance natural hydrological functions; maintain or replace low-water crossings, bridges, and culverts as appropriate or as guided by the Hydrological Assessment and Conceptual Restoration Plan.
2. Continue to cooperate with the SRWMD and the DEP for the monitoring of surface and ground water quality and quantity.

5.7 Forest Resource Management

Goal: Manage timber resources to improve or restore natural communities for the benefit of wildlife.

Long-term

1. Continue to implement the Forest Management Plan including reforestation, harvesting, and prescribed burning activities based on restoration and maintenance needs of the natural communities.
2. Continue to consult with the FFS or a professional forestry consultant regarding forest management activities, as appropriate.

5.8 Cultural Resources

Goal: Protect, preserve, and maintain cultural resources.

Long-term

1. Cooperate with the DHR in designing site plans for development of infrastructure.
2. Collaborate with DHR for potential cultural resource interpretive products.
3. Continue to follow the DHR's *Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties* for the management of cultural and historic resources.
4. Ensure any newly identified sites are reported to the DHR for inclusion in the FMSF.
5. Coordinate with the DHR to ensure that staff have received updated ARM training.

5.9 Capital Facilities and Infrastructure

Goal: Develop the capital facilities and infrastructure necessary to meet the goals and objectives of this Management Plan.

Short-term

1. Install a visitor counter.

Long-term

1. Construct an entrance package including accessible parking, an enhanced kiosk, and access to the kiosk.
2. Improve or repair the kiosk and two sheds.
3. Monitor trails and infrastructure annually for visitor impacts.
4. Continue to maintain three facilities.
5. Continue to maintain 19.09 miles of roads.

5.10 Land Conservation and Stewardship Partnerships

Goal: Enhance fish and wildlife conservation, resource, and operational management through internal and external partnerships and programs.

Long-term

1. Continue to identify and evaluate potential important wildlife habitat, landscape-scale linkages, wildlife corridors, and operational management needs for the SRWEA as appropriate and necessary.
2. Continue to contact and inform adjoining private landowners about the FWC Landowners Assistance Program, and coordinate with public entities to pursue conservation stewardship partnerships.
3. Staff will continue to maintain relationships with adjoining private landowners for nomination for the LAP Wildlife Habitat Recognition Program.
4. Continue to evaluate and identify FWC inholdings and additions priority parcels for potential conservation acquisition and pursue acquisitions as funding allows.
5. Continue to maintain a GIS shapefile and other necessary data to facilitate nominations for the FWC landowner assistance and conservation acquisition programs.
6. Continue to identify potential non-governmental land stewardship organization partnerships and grant program opportunities.
7. Determine the efficacy of conducting a landowner assistance/conservation stewardship partnership workshop(s) and pursue as necessary and appropriate.
8. Continue to evaluate and determine if any portions of the SRWEA are no longer needed for conservation purposes and therefore may be designated as surplus lands.

5.11 Cooperative Management, Special Uses, and Research Opportunities

Goal: Provide access and use of the SRWEA to current cooperative managers and continue collaborative management and research efforts.

Long-term

1. Continue to assess the need for and cooperate with researchers, universities, and others on research and environmental education partnership opportunities as appropriate.
2. Coordinate and cooperate with Department of Defense military branches to allow for training opportunities for military personnel and other initiatives as appropriate and compatible with the conservation of the SRWEA.

3. Collaborate with non-governmental organizations, community groups, stakeholders, and other private entities to forward common goals.

6 Resource Management Challenges and Strategies

The following section identifies and describes further management needs and challenges associated with the SRWEA and provides solution strategies that will address these challenges. These specific challenges may not be fully addressed in the broader goals and objectives section above and are thereby provided here.

Challenge 1: Meeting FWC law enforcement and management staff standards and needs can be challenging.

Strategy: Agency staff levels will continue to be evaluated to determine if increased staffing or other alternatives can meet management needs.

Strategy: Explore potential volunteer resources for assisting with habitat management, species monitoring, and area maintenance.

Challenge 2: Potential future development on adjacent lands can result in incompatible land uses increasing management challenges for the area.

Strategy: Cooperate and work with Hamilton County to ensure land use and zoning designations adjacent to the SRWEA will continue to be compatible with the management of the area.

Challenge 3: The SRWEA's proximity to roadways and residential areas presents smoke management challenges during prescribed burning.

Strategy: Use available tools and resources to minimize smoke impacts and increase outreach for areas of potential impact.

Strategy: Coordinate with the Division of Law Enforcement, Florida Highway Patrol, Florida Department of Transportation, FFS, and the Hamilton County Sheriff Office and Fire Department.

Challenge 4: The SRWEA is not a well-known public outdoor recreation destination.

Strategy: Work with local and Hamilton County tourism boards to promote the SRWEA and cross-promote the SRWEA with other regional public conservation lands.

Strategy: Work with the Florida Trail Association and SRWMD to assess the potential for a trail connection from the Florida National Scenic Trail to the SRWEA.

Strategy: Engage the local community in designing and delivering conservation education programs and recreational opportunities.

Strategy: Evaluate the impact that increased visitation and recreational use would have on wildlife and natural resources and adapt management activities, as necessary.

7 Cost Estimates and Funding Sources

The following represents the actual and unmet budgetary needs for managing the lands and resources of the SRWEA. This cost estimate was developed using data developed by the FWC and other cooperating entities and is based on actual costs for land management activities, equipment purchase and maintenance, and for development of fixed capital facilities.

The following cost estimate, although exceeding what the FWC typically receives through the appropriations process, is estimated to be what is necessary for optimal management and is consistent with the current and planned resource management and operation of the SRWEA. Cost estimate categories are those currently recognized by the FWC and the Land Management Uniform Accounting Council (Appendix 11.18). More information on these categories, as well as the Fiscal Year 2024-2025 operational plan showing detailed cost estimates by activity and categories of expenditures, may be found in Appendix 11.19.

SRWEA Management Plan Cost Estimate	*Maximum expected one-year expenditure*
Resource Management	Expenditure
Invasive Species Control	$243
Prescribed Burning	$1,527
Cultural Resource Management	$59
Timber Management	$30
Hydrological Management	$0
Vegetation Monitoring/Management	$2,070
Wildlife Monitoring/Management	$1,067
Subtotal	**$4,994**
Administration	
General Administration	**$325**
Support	
Land Management Planning	$1,105
Management Reviews	$2,955
Training/Staff Development	$335
Vehicle Purchase	$2,698
Vehicle Operation and Maintenance	$1,876
Other (Technical Reports, Data Management, etc.)	$701
Internal Program Review	$266
Technology and Data Management	$621
Subtotal	**$13,254**
Capital Improvements	
New Facility Construction	$0
Facility Maintenance	$1,502
Subtotal	**$1,502**
Visitor Services/Recreation	
Info./Education/Operations	**$1,048**
Law Enforcement	
Resource protection	**$130**
Total	**$21,255***

* Based on the characteristics and requirements of this area, 1 FTE position would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

SRWEA Management Plan Cost Estimate

Ten-year projection

Resource Management	Expenditure	Priority	Priority schedule:
Invasive Species Control	$2,131	(1)	**(1) Immediate (annual)**
Prescribed Burning	$13,413	(1)	
Cultural Resource Management	$519	(1)	(3) Other (5+ years)
Timber Management	$260	(1)	
Hydrological Management	$0	(1)	
Vegetation Monitoring/Management	$18,187	(1)	
Wildlife Monitoring/Management	$9,370	(1)	
Subtotal	**$43,881**		
Administration			
General Administration	**$2,856**	(1)	
Support			
Land Management Planning	$9,708	(1)	
Management Reviews	$25,963	(3)	
Training/Staff Development	$2,940	(1)	
Vehicle Purchase	$23,707	(2)	
Vehicle Operation and Maintenance	$16,481	(1)	
Other (Technical Reports, Data Management, etc.)	$6,160	(1)	
Internal Program Review	$2,337	(1)	
Technology and Data Management	$5,452	(1)	
Subtotal	**$92,748**		
Capital Improvements			
New Facility Construction	$431,134	(2)	
Facility Maintenance	$13,201	(1)	
Subtotal	**$444,334**		
Visitor Services/Recreation			
Info./Education/Operations	**$9,208**	(1)	
Law Enforcement			
Resource protection	**$1,146**	(1)	
Total			**$594,173***

* Based on the characteristics and requirements of this area, 1 FTE position would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

8 Analysis of Potential for Contracting Private Vendors for Restoration and Management Activities

The following management and restoration activities have been considered for outsourcing to private entities. It has been determined that items selected as “approved” are those that the FWC either does not have in-house expertise to accomplish or which can be done at less cost by an outside provider of services. Those items selected as “conditional” items are those that could be done either by an outside provider or by the agency at virtually the same cost or with the same level of competence. Items selected as “rejected” represent those for which the FWC has in-house expertise and/or which the agency has found it can accomplish at less expense than through contracting with outside sources:

	Approved	Conditional	Rejected
Dike and levee maintenance	✓		
Invasive species control		✓	
Mechanical vegetation treatment		✓	
Public contact and educational facilities development		✓	
Prescribed burning		✓	
Timber harvest activities	✓		
Vegetation inventories		✓	

9 Compliance with Federal, State, and Local Governmental Requirements

The operational functions of FWC personnel are governed by the agency’s Internal Management Policies and Procedures (IMPP) Manual. The IMPP Manual provides internal guidance regarding many subjects affecting the responsibilities of agency personnel including personnel management, safety issues, uniforms and personal appearance, and training, as well as accounting, purchasing, and budgetary procedures.

When public facilities are developed on areas managed by the FWC, every effort is made to comply with Public Law 101 - 336, the ADA Act. As new facilities are developed, the universal access requirements of this law are followed in all cases except where the law allows reasonable exceptions (e.g., where access accommodation is structurally impractical or where providing such access would change the fundamental character of the facility being provided).

Uses planned for the SRWEA are in compliance with the Conceptual State Lands Management Plan and its requirement for “balanced public utilization,” and are in compliance with the mission of the FWC as described in its Agency Strategic Plan. Such uses also comply with the authorities of the FWC as derived from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 373, 375, 378, 379, 403, 487, 597, and 870, F.S.

The FWC has developed and utilizes an Arthropod Control Plan for the SRWEA in compliance with Chapter 388.4111, F.S. (Appendix 11.20). This plan was developed in cooperation with the local Hamilton County arthropod control agency. This plan is also in conformance with the Local Government Comprehensive Plan as approved and adopted for Hamilton County, Florida, (Appendix 11.21).

10 Endnotes

[1] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions. Available online. Accessed [2019].

[2] Administration, N. O. (n.d.). Climate at a Glance. Retrieved from NOAA: National Centers for Environmental Information Time Series.

[3] Kato, S. and J. Ahern. 2008. 'Learning by doing': Adaptive planning as a strategy to address uncertainty in planning. Journal of Environmental Planning and Management 51: 543-559.

[4] Wilhere, G. F. 2002. Adaptive management in habitat conservation plans. Conservation Biology 16: 20-29.

[5] Walters, C. J. and R. Hilborn. 1978. Ecological optimization and adaptive management. Annual Review of Ecology and Systematics 9:157–188.

[6] Architectural and Transportation Barriers Compliance Board on Final Accessibility Guidelines for Outdoor Developed Areas, Final Report (2013).

11 Appendices

11.1 Lease Agreement No. 4405

1428.70 acres

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA

LEASE AGREEMENT

Suwannee Ridge Mitigation Park
Wildlife Environmental Area

Lease Number 4405

This lease is made and entered into this 10th day of September, 2002, between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "LESSOR", and the FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, hereinafter referred to as "LESSEE".

WITNESSETH:

WHEREAS, the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA holds title to certain lands and property being utilized by the State of Florida for public purposes, and

WHEREAS, the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA is authorized in Section 253.03, Florida Statutes, to enter into leases for the use, benefit and possession of public lands by State agencies that may properly use and possess them for the benefit of the people of the State of Florida;

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements hereinafter contained, LESSOR leases the below described premises to LESSEE subject to the following terms and conditions:

1. DELEGATIONS OF AUTHORITY: LESSOR'S responsibilities and obligations herein shall be exercised by the Division of State Lands, Department of Environmental Protection.

2. DESCRIPTION OF PREMISES: The property subject to this lease is situated in Hamilton County, Florida, and is more particularly described in Exhibit "A" attached hereto and hereinafter called the "leased premises".

3. TERM: The term of this lease shall be for a period of fifty years, commencing on September 10, 2002, and ending on September 9, 2052, unless sooner terminated pursuant to the provisions of this lease.

4. PURPOSE: LESSEE shall manage the leased premises only for the conservation and protection of natural and historical resources and resource based public outdoor recreation that is compatible with the conservation

and protection of these public lands, along with other related uses necessary for the accomplishment of this purpose as designated in the Management Plan required by paragraph 7 of this lease.

5. QUIET ENJOYMENT AND RIGHT OF USE: LESSEE shall have the right of ingress and egress to, from and upon the leased premises for all purposes necessary to the full quiet enjoyment by said LESSEE of the rights conveyed herein.

6. UNAUTHORIZED USE: LESSEE shall, through its agents and employees, prevent the unauthorized use of the leased premises or any use thereof not in conformance with this lease.

7. MANAGEMENT PLAN: LESSEE shall prepare and submit a Management Plan for the leased premises, in accordance with Section 253.034, Florida Statutes, and subsection 18-2.021(4), Florida Administrative Code, within twelve months of the effective date of this lease. The Management Plan shall be submitted to LESSOR for approval through the Division of State Lands. The leased premises shall not be developed or physically altered in any way other than what is necessary for security and maintenance of the leased premises without the prior written approval of LESSOR until the Management Plan is approved. The Management Plan shall emphasize the original management concept as approved by LESSOR at the time of acquisition which established the primary public purpose for which the leased premises were acquired. The approved Management Plan shall provide the basic guidance for all management activities and shall be reviewed jointly by LESSEE and LESSOR at least every five years. LESSEE shall not use or alter the leased premises except as provided for in the approved Management Plan without the prior written approval of LESSOR. The Management Plan prepared under this lease shall identify management strategies for exotic species, if present. The introduction of exotic species is prohibited, except when specifically authorized by the approved Management Plan.

8. RIGHT OF INSPECTION: LESSOR or its duly authorized agents shall have the right at any and all times to inspect the leased premises and the works and operations thereon of LESSEE, in any matter pertaining to this lease.

9. INSURANCE REQUIREMENTS: LESSEE shall procure and maintain fire and extended risk insurance coverage, in accordance with Chapter 284, F.S., for any buildings and improvements located on the leased premises by preparing and delivering to the Division of Risk Management, Department of Insurance, a completed Florida Fire Insurance Trust Fund Coverage Request Form and a copy of this lease immediately upon erection of any structures as allowed by paragraph 4 of this lease. A copy of said form and immediate notification in writing of any erection or removal of structures or other improvements on the leased premises and any changes affecting the value of the improvements shall be submitted to the following: Bureau of Public Land Administration, Division of State Lands, Department of Environmental Protection, Mail Station 130, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

10. LIABILITY: LESSEE shall assist in the investigation of injury or damage claims either for or against LESSOR or the State of Florida pertaining to LESSEE'S respective areas of responsibility under this lease or arising out of LESSEE'S respective management programs or activities and shall contact LESSOR regarding the legal action deemed appropriate to remedy such damage or claims.

11. ARCHAEOLOGICAL AND HISTORIC SITES: Execution of this lease in no way affects any of the parties' obligations pursuant to Chapter 267, Florida Statutes. The collection of artifacts or the disturbance of archaeological and historic sites on state-owned lands is prohibited unless prior authorization has been obtained from the Department of State, Division of Historical Resources. The Management Plan prepared pursuant to Section 253.034, Florida Statutes, shall be reviewed by the Division of Historical Resources to insure that adequate measures have been planned to locate, identify, protect and preserve the archaeological and historic sites and properties on the leased premises.

12. EASEMENTS: All easements including, but not limited to, utility easements are expressly prohibited without the prior written approval of LESSOR. Any easement not approved in writing by LESSOR shall be void and without legal effect.

13. SUBLEASES: This lease is for the purposes specified herein and subleases of any nature are prohibited, without the prior written approval of LESSOR. Any sublease not approved in writing by LESSOR shall be void and without legal effect.

14. SURRENDER OF PREMISES: Upon termination or expiration of this lease LESSEE shall surrender the leased premises to LESSOR. In the event no further use of the leased premises or any part thereof is needed, written notification shall be made to the Bureau of Public Land Administration, Division of State Lands, Department of Environmental Protection, Mail Station 130, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, at least six months prior to the release of all or any part of the leased premises. Notification shall include a legal description, this lease number and an explanation of the release. The release shall only be valid if approved by LESSOR through execution of a release of lease instrument with the same formality as this lease. Upon release of all or any part of the leased premises or upon expiration or termination of this lease, all permanent improvements, including both physical structures and modifications to the leased premises, shall become the property of LESSOR, unless LESSOR gives written notice to LESSEE to remove any or all such improvements at the expense of LESSEE. The decision to retain any improvements upon termination of this lease shall be at LESSOR'S sole discretion. Prior to surrender of all or any part of the leased premises, a representative of the Division of State Lands shall perform an on-site inspection and the keys to any buildings on the leased premises shall be turned over to the Division. If the leased premises and improvements located thereon do not meet all conditions set forth in paragraphs 18 and 21 herein, LESSEE shall pay all costs necessary to meet the prescribed conditions.

15. BEST MANAGEMENT PRACTICES: LESSEE shall implement applicable Best Management Practices for all activities conducted under this lease in compliance with paragraph 18-2.018(2)(h), Florida Administrative Code, which have been selected, developed, or approved by LESSOR, LESSEE or other land managing agencies for the protection and enhancement of the leased premises.

16. PUBLIC LANDS ARTHROPOD CONTROL PLAN: LESSEE shall identify and subsequently designate to the respective arthropod control district or districts within one year of the effective date of this lease all of the environmentally sensitive and biologically highly productive lands contained within the leased premises, in accordance with Section 388.4111, Florida Statutes and Chapter 5E-13, Florida Administrative Code, for the purpose of obtaining a public lands arthropod control plan for such lands.

17. UTILITY FEES: LESSEE shall be responsible for the payment of all charges for the furnishing of gas, electricity, water and other public utilities to the leased premises and for having all utilities turned off when the leased premises are surrendered.

18. ASSIGNMENT: This lease shall not be assigned in whole or in part without the prior written consent of LESSOR. Any assignment made either in whole or in part without the prior written consent of LESSOR shall be void and without legal effect.

19. PLACEMENT AND REMOVAL OF IMPROVEMENTS: All buildings, structures, improvements, and signs shall be constructed at the expense of LESSEE in accordance with plans prepared by professional designers and shall require the prior written approval of LESSOR as to purpose location, and design. Further, no trees, other than non-native species, shall be removed or major land alterations done without the prior written approval of LESSOR. Removable equipment placed on the leased premises by LESSEE which do not become a permanent part of the leased premises will remain the property of LESSEE and may be removed by LESSEE upon termination of this lease.

20. MAINTENANCE OF IMPROVEMENTS: LESSEE shall maintain the real property contained within the leased premises and any improvements located thereon, in a state of good condition, working order and repair including, but not limited to, keeping the leased premises free of trash or litter, maintaining all planned improvements as set forth in the approved Management Plan, meeting all building and safety codes in the location situated and maintaining any and all existing roads, canals, ditches, culverts, risers and the like in as good condition as the same may be at the date of this lease; provided, however, that any removal, closure, etc., of the above

improvements shall be acceptable when the proposed activity is consistent with the goals of conservation, protection, and enhancement of the natural and historical resources within the leased premises and with the approved Management Plan.

21. ENTIRE UNDERSTANDING: This lease sets forth the entire understanding between the parties and shall only be amended with the prior written approval of LESSOR.

22. BREACH OF COVENANTS, TERMS, OR CONDITIONS: Should LESSEE breach any of the covenants, terms, or conditions of this lease, LESSOR shall give written notice to LESSEE to remedy such breach within sixty days of such notice. In the event LESSEE fails to remedy the breach to the satisfaction of LESSOR within sixty days of receipt of written notice, LESSOR may either terminate this lease and recover from LESSEE all damages LESSOR may incur by reason of the breach including, but not limited to, the cost of recovering the leased premises or maintain this lease in full force and effect and exercise all rights and remedies herein conferred upon LESSOR.

23. NO WAIVER OF BREACH: The failure of LESSOR to insist in any one or more instances upon strict performance of any one or more of the covenants, terms and conditions of this lease shall not be construed as a waiver of such covenants, terms and conditions, but the same shall continue in full force and effect, and no waiver of LESSOR of any one of the provisions hereof shall in any event be deemed to have been made unless the waiver is set forth in writing, signed by LESSOR.

24. PROHIBITIONS AGAINST LIENS OR OTHER ENCUMBRANCES: Fee title to the leased premises is held by LESSOR. LESSEE shall not do or permit anything which purports to create a lien or encumbrance of any nature against the real property contained in the leased premises including, but not limited to, mortgages or construction liens against the leased premises or against any interest of LESSOR therein.

25. CONDITIONS AND COVENANTS: All of the provisions of this lease shall be deemed covenants running with the land included in the leased premises, and construed to be "conditions" as well as "covenants" as though the words

specifically expressing or imparting covenants and conditions were used in each separate provision.

26. DAMAGE TO THE PREMISES: (a) LESSEE shall not do, or suffer to be done, in, on or upon the leased premises or as affecting said leased premises or adjacent properties, any act which may result in damage or depreciation of value to the leased premises or adjacent properties, or any part thereof. (b) LESSEE shall not generate, store, produce, place, treat, release or discharge any contaminants, pollutants or pollution, including, but not limited to, hazardous or toxic substances, chemicals or other agents on, into, or from the leased premises or any adjacent lands or waters in any manner not permitted by law. For the purposes of this lease, "hazardous substances" shall mean and include those elements or compounds defined in 42 USC Section 9601 or which are contained in the list of hazardous substances adopted by the United States Environmental Protection Agency (EPA) and the list of toxic pollutants designated by the United States Congress or the EPA or defined by any other federal, state or local statute, law, ordinance, code, rule, regulation, order or decree regulating, relating to, or imposing liability or standards of conduct concerning any hazardous, toxic or dangerous waste, substance, material, pollutant or contaminant. "Pollutants" and "pollution" shall mean those products or substances defined in Chapters 376 and 403, Florida Statutes, and the rules promulgated thereunder, all as amended or updated from time to time. In the event of LESSEE'S failure to comply with this paragraph, LESSEE shall, at its sole cost and expense, promptly commence and diligently pursue any legally required closure, investigation, assessment, cleanup, decontamination, remediation, restoration and monitoring of (1) the leased premises, and (2) all off-site ground and surface waters and lands affected by LESSEE'S such failure to comply, as may be necessary to bring the leased premises and affected off-site waters and lands into full compliance with all applicable federal, state or local statutes, laws, ordinances, codes, rules, regulations, orders and decrees, and to restore the damaged property to the condition existing immediately prior to the occurrence which caused the damage. LESSEE'S

obligations set forth in this paragraph shall survive the termination or expiration of this lease. Nothing herein shall relieve LESSEE of any responsibility or liability prescribed by law for fines, penalties and damages levied by governmental agencies, and the cost of cleaning up any contamination caused directly or indirectly by LESSEE'S activities or facilities. Upon discovery of a release of a hazardous substance or pollutant, or any other violation of local, state or federal law, ordinance, code, rule, regulation, order or decree relating to the generation, storage, production, placement, treatment, release or discharge of any contaminant, LESSEE shall report such violation to all applicable governmental agencies having jurisdiction, and to LESSOR, all within the reporting periods of the applicable governmental agencies.

27. PAYMENT OF TAXES AND ASSESSMENTS: LESSEE shall assume full responsibility for and shall pay all liabilities that accrue to the leased premises or to the improvements thereon, including any and all drainage and special assessments or taxes of every kind and all mechanic's or materialman's liens which may be hereafter lawfully assessed and levied against the leased premises.

28. RIGHT OF AUDIT: LESSEE shall make available to LESSOR all financial and other records relating to this lease and LESSOR shall have the right to audit such records at any reasonable time. This right shall be continuous until this lease expires or is terminated. This lease may be terminated by LESSOR should LESSEE fail to allow public access to all documents, papers, letters or other materials made or received in conjunction with this lease, pursuant to Chapter 119, Florida Statutes.

29. NON-DISCRIMINATION: LESSEE shall not discriminate against any individual because of that individual's race, color, religion, sex, national origin, age, handicap, or marital status with respect to any activity occurring within the leased premises or upon lands adjacent to and used as an adjunct of the leased premises.

30. COMPLIANCE WITH LAWS: LESSEE agrees that this lease is contingent upon and subject to LESSEE obtaining all applicable permits and complying with all applicable permits, regulations, ordinances, rules, and laws of the

State of Florida or the United States or of any political subdivision or agency of either.

31. TIME: Time is expressly declared to be of the essence of this lease.

32. GOVERNING LAW: This lease shall be governed by and interpreted according to the laws of the State of Florida.

33. SECTION CAPTIONS: Articles, subsections and other captions contained in this lease are for reference purposes only and are in no way intended to describe, interpret, define or limit the scope, extent or intent of this lease or any provisions thereof.

34. ADMINISTRATIVE FEE: LESSEE shall pay LESSOR an annual administrative fee of $300. The initial annual administrative fee shall be payable within thirty days from the date of execution of this lease agreement and shall be prorated based on the number of months or fraction thereof remaining in the fiscal year of execution. For purposes of this lease agreement, the fiscal year shall be the period extending from July 1 to June 30. Each annual payment thereafter shall be due and payable on July 1 of each subsequent year.

IN WITNESS WHEREOF, the parties have caused this lease to be executed on the day and year first above written.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA

Witness
TRACY PETERS
Print/Type Witness Name

Witness
Print/Type Witness Name

By: _____ (SEAL)
GLORIA C. NELSON, OPERATIONS AND MANAGEMENT CONSULTANT MANAGER, BUREAU OF PUBLIC LAND ADMINISTRATION, DIVISION OF STATE LANDS, DEPARTMENT OF ENVIRONMENTAL PROTECTION

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 10th day of September 20 02 by Gloria C. Nelson, as Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Florida Department of Environmental Protection, acting as agent on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida.

Notary Public, State of Florida

Print\Type Notary Name Diane C. Rogowski
MY COMMISSION # DD113320 EXPIRES May 24, 2006
BONDED THRU TROY FAIN INSURANCE, INC.

Commission Number:

Commission Expires:

Approved as to Form and Legality

By: _____
DEP Attorney

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Brenda Collins
Witness
Brenda Collins
Print/Type Witness Name

Cynthia Byrd
Witness
Cynthia Byrd
Print/Type Witness Name

By: Victor J. Heller (SEAL)
Victor J. Heller
Print/Type Name

Title: Assistant Executive Director

"LESSEE"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 28th day of August 2002, by Victor J. Heller, as Assistant Executive Director Florida Fish and Wildlife and Conservation Commission. He/~~she~~ is personally known to me or produced _____ as identification.

Jimmie C. Bevis
Notary Public, State of Florida

JIMMIE C. BEVIS
Print/Type Notary Name

Commission Number:

Commission Expires:

Jimmie C. Bevis
MY COMMISSION # DD077239 EXPIRES
December 26, 2005
BONDED THRU TROY FAIN INSURANCE, INC.

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
Commission Attorney

11.2 Public Hearing Notice, Advertisements, and Press Release

11.2.1 Public Hearing Notice

NOTICE

Florida Fish and Wildlife Conservation Commission
Announces a

PUBLIC HEARING

for the

Suwannee Ridge Wildlife and Environmental Area Management Plan

Hamilton County, Florida
6:00 P.M. Tuesday, December 10, 2024

Hamilton County Courthouse Annex
1153 NW U.S. Hwy 41
Jasper, FL 32052

PURPOSE: To receive public comment regarding considerations for the FWC ten-year Land Management Plan for the Suwannee Ridge Wildlife and Environmental Area (SRWEA). This hearing is being held EXCLUSIVELY for discussion of the Suwannee Ridge WEA Management Plan, which outlines environmental and recreation management on the area. This Management Plan will not address hunting or fishing regulations, which are handled through a separate rule and regulation development process. For more information about the rule and regulation development process, go online to: http://myfwc.com/about/rules-regulations/

For a copy of the draft Management Plan, please contact Cedar Spirk, via email at Cedar.Spirk@MyFWC.com, or via mail at Florida Fish and Wildlife Conservation Commission, Land Conservation and Planning, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting should notify the agency at least five calendar days before the meeting by calling 850-488-6411 or contact the agency using the Florida Relay Service at 800-955-8771 (TDD) or 800-955-8770 (Voice), if you are hearing or speech impaired. If you believe that you have been discriminated against in any program, activity, or facility, or if you need more information, contact the Florida Fish and Wildlife Conservation Commission at: FWC, Office of Human Resources, 620 S Meridian Street, Tallahassee, FL 32399, 850-488-6411. Or write to: Office of Diversity, Inclusion & Civil Rights, Department of the Interior, 1849 C Street, NW, Washington, D.C. 20240.

11.2.2 Regional FWC Press Release

Florida Fish and Wildlife Conservation Commission

Site Search

Home > FWC News > Help plan the future of Suwannee Ridge Wildlife and Environmental Area

Help plan the future of Suwannee Ridge Wildlife and Environmental Area



Media contact: Ryan Sheets, 727-282-7642 or Ryan.Sheets@MyFWC.com

Release Date: 11-04-2024

< All Articles

Tags:

Wildlife | WMA | Public Meeting

Photos available

The Florida Fish and Wildlife Conservation Commission (FWC) invites you to attend the Suwannee Ridge Wildlife and Environmental Area Management Plan Amendment public hearing on Tuesday, Dec. 10. The public hearing will be held at 6 p.m. at the Hamilton County Courthouse Annex, 1153 NW U.S. Highway 41, Jasper, FL 32052.

The Suwannee Ridge WEA conserves and protects 1,429 acres in southern Hamilton County. Conserving important habitat within a chain of conservation lands that lie along the Suwannee River, this WEA provides connectivity within a major wildlife corridor where many species of birds and other wildlife migrate. The Suwanee Ridge WEA also conserves an imperiled, keystone sandhill species, the gopher tortoise.

"Mobility-impaired quota hunts continue to be a popular recreational activity on the SRWEA," said **Christina Omran, FWC Biological Administrator**. "Other public uses include hiking, photography, nature study and wildlife viewing."

To obtain a copy of the draft management prospectus, contact Cedar Spirk, Lead Planner, at Cedar.Spirk@MyFWC.com, or Christina Omran, Professional Wetland Scientist, at Christina.Omran@MyFWC.com. The public is encouraged to attend and will have the opportunity to comment on and ask questions regarding the plan amendment. Maps, drawings and other information will be available on display.

For more information regarding this and other upcoming public hearings, visit MyFWC.com/Conservation then click "Terrestrial Conservation" and "Management." Hunting and fishing regulations will not be included in this plan or public hearing; they are addressed through a separate public process.

Visit MyFWC.com/Hunting or MyFWC.com/Fishing to learn more about hunting and fishing regulations.
Pursuant to Chapters 253 and 259, Florida Statutes, all lands purchased with public funds must have a Land Management Plan that ensures the property will be managed in a manner that is consistent with the intended purposes of the purchase.

Public participation is solicited without regard to race, national origin, sex, religion, disability or family status. Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting must notify the agency at least five calendar days before the meeting by calling 850-488-6411 or contacting the agency using the Florida Relay Service at 800- 955-8771 (TDD) or 800-955-8770 (Voice), if you are hearing or speech impaired. If you believe that you have been discriminated against in any program, activity, or facility, or if you need more information, contact the Florida Fish and Wildlife Conservation Commission at:

FWC, Office of Human Resources
620 S Meridian Street,
Tallahassee, FL 32399

Or write to:

Office of Diversity, Inclusion & Civil Rights
Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

11.2.3 Newspaper

The Florida Fish and Wildlife Conservation Commission (FWC) announces a PUBLIC HEARING for the Suwannee Ridge Wildlife and Environmental Area located in Hamilton County, Florida.

6:00 p.m. Tuesday, Dec. 10, 2024
Hamilton County Courthouse Annex
1153 NW U.S. Hwy 41
Jasper, FL 32052

PURPOSE: To receive public comment regarding considerations for the FWC's 10-year Management Plan for the FWC Lead Managed Portions of the Suwannee Ridge Wildlife and Environmental Area (WEA).

This hearing is being held EXCLUSIVELY for discussion of the DRAFT Suwannee Ridge WEA Management Plan, otherwise referred to as the Management Prospectus. This meeting will not address area hunting or fishing regulations. For more information on the process for FWC rule and regulation development, visit our Proposed Rules Changes webpage at https://myfwc.com/about/rules-regulations/proposed-rule-changes/.

A Management Prospectus for the Suwannee Ridge WEA and a copy of the agenda is available upon request from Christina Omran and Cedar Spirk by mail at the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, Florida 32399-160 or by email at Christina.Omran@MyFWC.com and Cedar.Spirk@MyFWC.com.

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this meeting should notify the agency at least five calendar days before the meeting by calling (850) 488-6411 or contact the agency using the Florida Relay Service at (800) 955-8771 (TDD) or (800) 955-8770 (Voice), if you are hearing or speech impaired. If you believe that you have been discriminated against in any program, activity, or facility, or if you need more information, contact the Florida Fish and Wildlife Conservation Commission at:

FWC, Office of Human Resources
620 S Meridian Street
Tallahassee, FL 32399, (850) 488-6411

Or write to:

Office of Diversity, Inclusion & Civil Rights
Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

11/27

11.2.4 Florida Administrative Register Ad

Notice of Meeting/Workshop Hearing

FISH AND WILDLIFE CONSERVATION COMMISSION

The Florida Fish and Wildlife Conservation Commission announces a hearing to which all persons are invited.
DATE AND TIME: Tuesday, December 10, 2024, 6:00 p.m.
PLACE: Hamilton County Courthouse Annex, 1153 NW U.S. Hwy 41, Jasper, FL 32052
GENERAL SUBJECT MATTER TO BE CONSIDERED: To receive public comment regarding considerations for the FWC's 10-year Management Plan for the FWC Lead Managed Portions of the Suwannee Ridge Wildlife and Environmental Area (WEA). This hearing is being held EXCLUSIVELY for discussion of the DRAFT Suwannee Ridge WEA Management Plan, otherwise referred to as the Management Prospectus. This meeting will not address area hunting or fishing regulations. For more information on the process for FWC rule and regulation development, visit our Proposed Rules Changes webpage at https://myfwc.com/about/rules-regulations/proposed-rule-changes/.
A copy of the agenda may be obtained by contacting: Christina Omran and Cedar Spirk by mail at the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, Florida 32399-160, or by email at Christina.Omran@MyFWC.com and Cedar.Spirk@MyFWC.com.
Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in this workshop/meeting is asked to advise the agency at least 5 days before the workshop/meeting by contacting: the ADA Coordinator at (850)488-6411. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1(800)955-8771 (TDD) or 1(800)955-8770 (Voice).
For more information, you may contact: Christina Omran and Cedar Spirk by mail at the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, Florida 32399-160, or by email at Christina.Omran@MyFWC.com and Cedar.Spirk@MyFWC.com.

11.3 Public Input

11.3.1 Management Advisory Group Meeting Results

Suwannee Ridge Wildlife and Environmental Area (SRWEA)
Management Advisory Group (MAG)
Consensus Meeting Results

October 16, 2024, in Jasper, Florida

The intent of convening a consensus meeting is to involve a diverse group of stakeholders in assisting the Florida Fish and Wildlife Conservation Commission (FWC) in development of a rational management concept for lands within the agency's managed area system. FWC does this by asking spokespersons for these stakeholders to participate in a half-day meeting to provide ideas about how FWC-managed lands should be protected and managed.

The MAG consensus meeting was held on the morning of October 16, 2024, at the Hamilton County IFAS Extension Building, in Jasper, Florida in Hamilton County. The ideas found below were provided by stakeholders for consideration in the 2025 - 2035 Management Plan (MP) with priority determined by vote. These ideas represent a valuable source of information to be used by biologists, planners, administrators, and others during the development of the MP. Upon approval by FWC, the Acquisition and Restoration Council (ARC), and the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), the MP will guide the activities of FWC personnel over the ten-year duration of the management plan and will help meet agency, state, and federal planning requirements.

Numbers to the left of **bold-faced ideas** listed below represent the total number of votes and the score of each idea. Rank is first determined by the number of votes (vote cards received for each idea) and then by score. Score is used to break ties when two or more ideas have the same number of votes. A lower score indicates higher importance because each voter's most important idea (recorded on card #1) received a score of 1, and their fifth most important idea (recorded on card #5) received a score of 5. Ideas not receiving any votes are listed, and were considered during the development of the MP, but carry no judgment regarding priority.

Statements following the bold-faced ideas represent a synopsis of the clarifying discussion of ideas as transcribed and interpreted by the FWC recorder at the meeting. As indicated above, the ideas below are presented in priority order:

Rank	# of Votes	Score	Idea	
1.	[3]	[6]	17.	**Maintain natural community management and maintenance on all natural communities.**
2.	[2]	[2]	1.	**Continue to implement the prescribed fire program.** The primary tool for SRWEA is prescribed fire, and it's important to keep that up.

Rank	# of Votes	Score	Idea	
3.	[2]	[4]	5.	**Maintaining and providing road and access routes.** This goes along with wildlife viewing opportunities. Nature-based exposure is up, so there needs to be advocacy and promotion of the recreation opportunities, not just for the hunters, for everyone. These opportunities need to be made accessible.
4.	[2]	[5]	10.	**Continue management and monitoring of locally important and listed species.** Although this area was purchased initially for gopher tortoise habitat and protection, there are a lot of other species that go along with gopher tortoises and sandhill communities. The FWC has a WCPR plan in place, which should continue to br implemented to ensure proper management.

Two items of equal rank:

5.	[2]	[6]	3.	**Protect, preserve, promote cultural resources on property.** In 2016, the DHR conducted a cultural resoruces reconnaissance survey. Due to turnover those results weren't communicated, so DHR is currently focused on rectifying that for this Management Plan. The archaeological resources aren't always obvious, so it's important for land managers to have records of them to manage accordingly. Protect, preserve and promote are distinct actions from the DHR perspective. It's important for land managers to visit sites annually to check for damage, like vandalism, erosion, animal damage, trees falling and exposing artifacts.There's only four of us in the archaeologial section at the DHR, so land managers are relied upon to keep an eye on the sites. Prior to any impactful activites on archaeoloigcal sites, the FWC should discuss it with the DHR. It would also be good to develop interpretive signage based on work that's been done on the property, and give the public some insight into pre-historic and historic use of the property.

Rank	# of Votes	Score	Idea	
6.	[2]	[6]	9.	**Expand on recreational opportunities for underserved populations.** This does not just apply to the mobility impaired, but to all disabiltiies. Trails for wildlife viewing should be enhanced and expanded to accommodate other disabilities, so they can enjoy same visuals as other people can do.
7.	[2]	[8]	13.	**Implement environmental educational opportunities and conservation advocacy.**
8.	[2]	[9]	14.	**Continue to monitor and treat invasive vegetation.** Spots where invasive species have occurred in the past need to be treated as soon as possible.

Two items of equal rank:

9.	[1]	[2]	8.	**Continue working with partners and other agencies.** The SRWMD would like to continue a working relationship with open communication regarding the SRWEA.
10.	[1]	[2]	16.	**Continue to prioritize equal access and inclusion in programs on SRWEA.**
11.	[1]	[3]	4.	**Continue to focus on public use and recreational opportunities.** Similar to the unique mobility-impaired hunts, this is a big part of public lands. The FWC should continue with this as well as other recreational opportunities, such as wildlife viewing, to give the public the opportunity to see the unique ground cover that's in that area.

Three items of equal rank:

12.	[1]	[4]	6.	**Continue to implement timber management plan.** Five years ago a timber inventory was completed, and then the following year the FWC had a contractor develop a 40-year Timber Management Plan, with the goal of moving all of the stands on the SRWEA from even-aged plantation to more of a multi-age, multi-use stand. This includes planting longleaf.

Rank	# of Votes	Score	Idea	
13.	[1]	[4]	11.	**Make every habitat type accessible via trail system.** If trails are not available to view every habitat type on the SRWEA, then th FWC should consider creating new trails for access.
14.	[1]	[4]	18.	**Enhance habitat for game species**.

Two items of equal rank:

15.	[1]	[5]	7.	**Keep up with trail maintenance.**
16.	[1]	[5]	15.	**Ensure mobility impaired access for wildlife viewing.**

The following item received no votes. All ideas represent valuable input, and are considered in development of the MP, but carry no rank regarding the priority perceptions of the MAG.

17.	[]	[]	2.	**Maintain sandhill community.** The Audubon Society is familiar with land management practies and appreciates the role of burning to maintain habitats for plants and animals.
18.	[]	[]	12.	**Focus on mobility-impaired hunting**.

Suwannee Ridge Wildlife and Environmental Area
MAG Meeting Participants

Name	**Affiliation**
Active Participants	
Scottland Talley	FWC HSC, District Biologist
Steven Carpenter	Suwannee River Water Management District
Jerry Krummrich	Four Rivers Audubon Society
Jason O'Donoughue	Division of Historical Resources
David Jones	FL Disabled Outdoors Association
Supportive Participants	
Matt Pollock	FWC Habitat and Species Conservation (HSC), Regional Biologist
Sharon Hester	FWC HSC, Assistant Regional Biologist
Joe Vaughn	FWC HSC, Landowner Assistance Program
Tom M. Matthews	FWC HSC, Public Access and Recreational Opportunities (PASO) Planner
Paul Jacobs	FWC Northeast Region Volunteer Program
Rudy Spirk	FWC HSC, Area Biologist
Alex Roukis	FWC HSC, Area Biologist
Eddie Bruce	FWC HSC, PASO Biologist
Corwynne Pugh	FWC HSC, PASO Biologist
Invited but Unable to Attend	
Geoffrey Parks	Florida Natural Areas Inventory
Jade Green	Florida Geological Survey
Robby Roberson	Hamilton County Commissioner
Matthew Morgan	Hamilton County Planning Department
Greg Staten	Florida Forest Service
Greg Strong	Northwest Region Department of Environmental Protection
Aalia Mcclendon	Natural Resources Conservation Service
Adam Fryska	Florida Trail Association
Gregory T. Hicks	Hamilton County IFAS Extension Office Representative
Ed Rock	Adjacent Private Landowner, Skeeter Ranch
Ricky Lackey	National Wild Turkey Federation
Scott Lee	FWC Law Enforcement
Mitchell Cline	FWC Law Enforcement
Holli Nichols	FWC Division of Hunting and Game Management
Katherine Burke	FWC HSC, PASO Section Leader
Ben Rangel	FWC HSC, PASO Outreach/Interpretive Representative
Logan Benedict	FWC HSC, Climate Resiliency Team
Rebecca Doane	FWC HSC, Regional Conservation Biologist

Ed Hayes	FWC Regional Aquatic Habitat Conservation and Restoration Administrator
Ben Hines	FWC Regional Florida Youth Conservation Centers Network

FWC Planning Personnel

Cedar Spirk	Land Conservation Planner IV, Facilitator
Savannah Atwell	Land Conservation Planner IV, Recorder
Elizabeth Norregaard	Land Conservation Planner IV, Recorder
Christina Omran	Senior Land Conservation Planner, Co-Facilitator

11.3.2 Public Hearing Report

PUBLIC HEARING REPORT

FOR

SUWANNEE RIDGE WIILDLIFE AND ENVIRONMENTAL AREA (SRWEA)

MANAGEMENT PLAN

HELD BY THE

SRWEA MANAGEMENT ADVISORY GROUP

AND THE

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

JANUARY 10, 2024 – HAMILTON COUNTY

The following report documents the public input that was received at the Suwannee Ridge WEA (SRWEA) Management Advisory Group's (MAG) public hearing for the update to the Management Plan for SRWEA that was held at 6:00-8:00 PM, on December 10, 2024, at the Hamilton County Courthouse in Jasper, Florida.

SRWEA Management Advisory Group Introduction:

The meeting was introduced by David Jones, a SRWEA Management Advisory Group participant, who represented the SRWEA MAG. Mr. Jones indicated that he was one of four stakeholders that attended the Florida Fish and Wildlife Conservation Commission (FWC) facilitated SRWEA MAG meeting held on October 16, 2024. David Jones stated that the elements of the Draft Management Plan were being presented tonight by FWC staff, and that hardcopies of the overview, management prospectus and the SRWEA MAG meeting report were available at the front door for the public's review. Mr. Jones thanked everyone for attending and then introduced Cedar Spirk, Lead Planner, FWC, to facilitate and coordinate the presentation of an overview of SRWEA, FWC's planning process, and the draft components of the SRWEA Draft Management Plan.

Presentation on an Overview of SRWEA and the FWC Planning Process:

FWC member Cedar Spirk welcomed everyone and thanked the public for their attendance. Cedar then went over an orientation of the material and explained that the purpose of the public hearing was to solicit public input regarding the Draft Management Plan for SRWEA, and not hunting and fishing regulations, indicating there is a separate public input process for FWC rule and regulation development. Cedar then described the materials that were available at the door for public review, including the SRWEA Management Prospectus and the MAG Meeting Report. Cedar then presented the agenda for the public hearing and facilitated the introduction of all FWC staff in attendance to the audience. Cedar then presented an overview and orientation of SRWEA,

including a description of the natural communities, data about SRWEA visitation, revenue and economic benefits generated for the state and region by the area, wildlife species, recreational opportunities found on the area, surrounding conservation lands, surrounding Florida Forever Program Land Acquisition Projects, acquisition history, etc. They also explained FWC's planning process for the management of the public conservation land and asked if there were any questions regarding that process.

Questions, Answers and Discussion on the SRWEA Overview and FWC's Planning Process:

Cedar Spirk facilitated an informal question and answers session where members of the public in attendance, without necessarily identifying themselves, could ask questions of the FWC staff, and discuss the answers. Cedar again emphasized that the exclusive purpose for the public hearing was to collect public input regarding the elements of the Draft Management Plan for SRWEA, and not to discuss area hunting, fishing and use regulations since, as was noted earlier, FWC has a separate process for input on hunting and fishing regulations.

No questions or comments were received at this stage of the SRWEA public hearing meeting.

Presentation of the SRWEA Draft Management Plan:

At this point, Cedar Spirk, began the presentation of the SRWEA Draft Management Plan. Cedar then completed and concluded the presentation of the SRWEA Draft Management Plan.

Public Question 1: An unidentified member of the audience provided the following comments and questions:

What does "if feasible" mean?

FWC Response: Scotland Talley, District Biologist, responded:

That would likely be a cost thing. Back when the Gopher Tortoise was a candidate for federal listing, the US FWS became enamored with this Line-Transect-Distance sampling methodology that requires folks to go out and survey on a small area like this, virtually the entire property, to take a scope and put it into every single gopher tortoise burrow encountered. So, it is expensive and very time consuming. We have a state-wide prioritization of areas work plan, and we contract FNAI annually to do the surveys. At some point in the future, someone may look at the budget line. The fed's have declined to list the gopher tortoise.

Public Question 2: The same unidentified member of the audience provided the following comments and questions:

So, are they endangered or threatened, or what?

FWC Response: Scotland Talley, District Biologist, responded:

They are State Threatened. They are Federally Endangered in Louisiana, Mississippi, and SW Alabama. There was a petition to list them throughout their range in S Carolina, but they said FL

is doing great. We have a state-wide gopher tortoise mitigation program. Georgia has also purchased land to dedicate to gopher tortoises.

Public Question 3: The same unidentified member of the audience provided the following comments and questions:

Do you have other mitigation properties?

FWC Response: Scotland Talley, District Biologist, responded:

We have quite a few. We've got six in this region, and an additional six or seven in the southwest and northeast regions, that were purchased under the old Gopher Tortoise Mitigation Program. We have a lot of WMAs that have communities suitable for them.

Public Question 4: The same unidentified member of the audience provided the following comments and questions:

Is there no longer funding for these gopher mitigation properties?

FWC Response: Scotland Talley, District Biologist, responded:

It's just under a different program now. We do acquisitions through the Florida Forever Funding, and certainly gopher tortoise habitats would be high on our priority. Fortunately, for us, these properties were purchased for that purpose, and we've been managing them with that purpose in mind. They like those nice pine savannas, and they like burns more than people realize.

Public Question 5: The same unidentified member of the audience provided the following comments and questions:

Do you have recreations to help identify what you're looking for?

FWC Response: Scotland Talley, District Biologist, responded:

Well, we've had discussions about things like iNaturalist, and we certainly use those for information. But, our data base, we use our folks or contract with FNAI, and they want to keep our database managed by working wildlife biologists. And nowadays, photos taken on phones have metadata, so I can see if it was found on the property.

Public Question 6: The same unidentified member of the audience provided the following comments and questions:

I've been out there my whole life, and I've seen a lot of diamond backs and timber rattlers, it's the most I've ever seen in all these years.

FWC Response: Scotland Talley, District Biologist, responded:

I know, when I first started burning on the SRWEA, I said, "This isn't a gopher tortoise mitigation park, this is a snake mitigation park!" I've seen a lot of eastern diamond backs, timber rattlers,

and coachwhips everywhere. It's like every time you turn around, there's a snake coming out of the burn units.

Public Question 7: The same unidentified member of the audience provided the following comments and questions:

There's a lot of trees along Rattlesnake Road, are you planning on timbering them?

FWC Response: Scotland Talley, District Biologist, responded:

No, those are slash pines, and there's also some open slashpine timber on the west side. What we're doing is, all those areas have been thinned, and once they've been thinned, we are underplanting longleaf. In about 30 years, you know, someone may decide to cut those out.

Questions and Comments on the SRWEA Draft Management Plan Presentation:
Cedar Spirk asked if there were any comments or questions from the public regarding the Draft Management Plan and encouraged everyone to fill out a speaker card for public testimony. They informed them that all comments, questions, and public testimony will be duly considered equally by FWC.

No questions or comments were received at this stage of the SRWEA public hearing meeting.

Public Testimony on the SRWEA Draft Management Plan:
One member of the public audience submitted speaker card(s) indicating their intention to provide formal public testimony. Cedar again emphasized that the public hearing was for taking input regarding the SRWEA Draft Management Plan and called the first speaker to the podium.

Public Testimony 1: Michelle Curtis provided the following public testimony:

Thank you for the opportunity to provide input. I'm Michelle Curtis, and I'm a forester, I've been working in the forestry business for over 45 years, but tonight I'm here representing the North Florida Back Country Horsemen as an equestrian. As I heard the presentation tonight, I did not hear anything, as far as your goals and objectives, that equestrian use would conflict with what you're trying to accomplish. Equestrians have no issue staying on designated trails, it's not like we're trying to o cross-country on a tract if it's unacceptable. We are very happy using existing trails, roads, and fire lines, and staying on those. We would like to see you add equestrian uses to your goals and objectives sheet.

Let me tell you about the North Florida Back Country Horsemen. We're not a trail-riding group, we do ride horses on trails, but our job is to assist the public agencies that are landowners. We volunteer our time, if you are willing to allow us to establish horse trails on the properties. What we've done with Water Management Districts and others, we go on the existing trails and roads and map out the proposed routes. If the Water Management District accepts our proposal, they work with us and tell us how they want us to do the marking. They provide the tools and resources needed, then we go do the work. We also do the maintenance for the trails as far as trimming, you know, some of the maintenance they don't want us to do. We don't take on everything

because we have a limited work force, people like me who are retired. We don't take on more than we can maintain.

You won't see us talking to you about every tract, but those where we have club members who are interested and willing to put the sweat equity in. Those are ones we show up at, and say we'd like to be able to help you if you are accepting volunteers, which you did say that you want volunteers. I think we can help you check that box. We ask that you look at us the same way you'd look at the Florida Trail Association. We are a nationwide group, we have a number of chapters in Florida, but ours is the North Florida Back Country group.

Now, let me get into the notes that I took during your presentation. First of all, I haven't been on the tract since I wrote the forest management plan. IT was a beautiful tract then, and it's a beautiful tract now. I went in through the Holton Creek WMA side, and you're doing a beautiful job. I truly don't see anything equestrians would do that would cause a problem with you meeting all your objectives. I know that you have the hunting out there, and I respect that, we don't want to be out there when hunters are hunting. If you have certain days, it's fine for us if you say that "these days aren't available, you cannot come here these days". Post that on the website, and we make sure the equestrians are aware of that so that we don't go out there during that time, or same for other special events that you got. We just want to be able to enjoy what you're doing. We are the type who enjoys the work you're doing as far as bird watching or seeing the deer run through the forest. As far as gopher tortoises, trail rides typically are slow. Only race events or speed events, that's not the trail riding. We walk slow, so we can see gopher tortoises and their burrows, so there's not a risk for us to step on them. I just don't see that we would conflict with your primary purposes for the tract.

On of the things you said, which I really appreciated, because of the impact of the hurricanes on lots of state lands, some of them need to be clear cut to reestablish a stand. If you can do a heavy thin and do the under planting, and still accomplish your goals, later those fires will take out trees since some of those are not fire tolerant. But you'll still have a forest left, and you can establish than an even age management sooner.

I've got a couple more brief points. Something I think is special about this tract, is that it's adjacent to Holton Creek, and it would be very nice if we could publish trail maps the combine both, which we could move back and forth. Do you see any conflict with equestrians being on this tract?

FWC Response: Tom Matthews, Public Access Planner, responded:

Nothing immediately comes to mind. However, us putting it in the plan doesn't make it so, because it requires a rule change which is separate process. Regional staff an put you in contact with the person that does the rule process, so you propose the rule, it goes through internal review, and then it goes out for public comment. Then it's either incorporated in the rule or not.

Public Response: Michelle Curtis continued this line of comments and questions:

Help me understand this rule change. The rule change would say that you're allowed to then use this as a use, and when you're drafting that plan is when it's the time to change those things.

FWC Response: Tom Matthews, Public Access Planner, responded:

No, this is completely separate from the rule process.

Public Response: Michelle Curtis continued this line of comments and questions:

So a rule change would have to occur for you to allow equestrian uses is what you're telling me?

FWC Response: Tom Matthews, Public Access Planner, responded:

Correct.

Public Response: Michelle Curtis continued this line of comments and questions:

Alright. So, I'd like to mention one other thing. I recognize a rule change will have to happen if you want to do this, but if we are successful in getting equestrian use available on the property. . . If you're talking about doing a parking lot, the parking lot you have available is way too small for equestrians to use. The one area you can do that, is here by the gate, the grass is quite expansive here, enough where you could turn a trailer around and park it there, and there's the fence so horses won't be running out on the highway. I ask that you consider making this an equestrian entrance, or just allow the horses to enter through Holton Creek. I noticed the post-it signs along the southern boundary of the tract, and it sounded like the horses weren't allowed past that boundary, is that correct?

FWC Response: Tom Matthews, Public Access Planner, responded:

Correct. If the rule says there is no horseback riding, then it doesn't matter where you originate.

Public Response: Michelle Curtis continued this line of comments and questions:

Okay, so I'm recommending that when the rule change is requested, that it's done. Because I haven't heard any kind of objection to this, other than "it's the rule".

FWC Response: Christina Omran, Senior Land Conservation Planner, responded:

The land management plans and the way that we manage the land is in line with the purpose of acquisition, and the land acquisition programs utilized for that purchase, and this team presents the information. So, just like Tom can provide you with who to contact for that, I can as well, and so one of the two of us would be happy to help you with that.

Adjournment:

Cedar Spirk asked if there were any other members of the public that wished to give public testimony.

No other speakers offered further comments.

Then Cedar Spirk declared the public hearing adjourned.

11.4 Native Plant and Wildlife Species Lists

11.4.1 Native Plant Species

Scientific Name	Common Name
Acalypha gracilens	Slender threeseed mercury
Acer rubrum	Red maple
Aeschynomene viscidula	Sticky jointvetch
Agalinis fasciculata	Beach false foxglove
Agalinis sp.	False foxglove
Ageratina aromatica	Lesser snakeroot
Ageratina jucunda	Hammock snakeroot
Ageratum sp.	Whiteweed
Agrimonia incisa	Harvest lice
Ambrosia artemisiifolia	Common ragweed
Ambrosia psilostachya	Western ragweed
Ambrosia sp.	Ragweed
Amorpha fruticosa	False indigobush
Amorpha herbacea var. *herbacea*	Clusterspike false indigobush
Ampelopsis arborea	Peppervine
Amphicarpaea bracteata	American hogpeanut
Amphicarpum muehlenbergianum	Blue maidencane
Amsonia ciliata	Fringed bluestar
Amsonia tabernaemontana	Eastern bluestar
Andropogon floridanus	Florida bluestem
Andropogon glomeratus var. *glaucopsis*	Purple bluestem
Andropogon glomeratus var. *glomeratus*	Bushy bluestem
Andropogon sp.	Bluestem
Andropogon ternarius	Splitbeard bluestem
Andropogon virginicus	Broomsedge bluestem
Andropogon virginicus var. *glaucus*	Chalky bluestem
Aralia spinosa	Devil's walkingstick
Arisaema dracontium	Greendragon
Aristida gyrans	Corkscrew threeawn
Aristida longespica var. *geniculata*	Red threeawn
Aristida purpurascens	Arrowfeather threeawn
Aristida sp.	Threeawn
Aristida stricta	Wiregrass
Aristolochia serpentaria	Virginia snakeroot
Aristolochia sp.	Dutchman's pipe
Aronia arbutifolia	Red chokeberry

Asclepias amplexicaulis	Clasping milkweed
Asclepias pedicellata	Savannah milkweed
Asclepias tuberosa	Butterflyweed
Asclepias verticillata	Whorled milkweed
Asemeia violacea	Showy milkwort
Asimina angustifolia	Slimleaf pawpaw
Asimina incana	Woolly pawpaw
Asimina obovata	Bigflower pawpaw
Asimina parviflora	Smallflower pawpaw
Asimina spatulata	Pawpaw
Asplenium platyneuron	Ebony spleenwort
Azolla filiculoides	American waterfern
Balduina angustifolia	Coastalplain honeycomb-head
Baptisia alba	White wild indigo
Baptisia lecontei	Pineland wild indigo
Berchemia scandens	Rattan vine
Berlandiera pumila	Soft greeneyes
Bidens bipinnata	Spanish needles
Bignonia capreolata	Crossvine
Boehmeria cylindrica	False nettle
Botrychium biternatum	Southern grape-fern
Bulbostylis ciliatifolia	Capillary hairsedge
Bulbostylis sp.	Hairsedge
Bulbostylis warei	Ware's hairsedge
Callicarpa americana	American beautyberry
Campsis radicans	Trumpet creeper
Carex glaucescens	Clustered sedge
Carex sp.	Sedge
Carphephorus corymbosus	Coastalplain chaffhead
Carphephorus sp.	Chaffhead
Carpinus caroliniana	American hornbeam
Cartrema americanum	Wild olive
Carya glabra	Pignut hickory
Carya sp.	Hickory
Carya tomentosa	Mockernut hickory
Castanea pumila	Chinquapin
Ceanothus americanus	New Jersey tea
Celtis laevigata	Sugarberry
Cenchrus echinatus	Southern sandbur
Centella asiatica	Spadeleaf

Centrosema virginianum	Spurred butterfly pea
Cephalanthus occidentalis	Common buttonbush
Chamaecrista fasciculata	Partridge pea
Chamaecrista nictitans	Sensitive pea
Chamaesyce cordifolia	Heartleaf sandmat
Chamaesyce hyssopifolia	Hyssopleaf sandmat
Chamaesyce sp.	Sandmat
Chasmanthium laxum	Slender woodoats
Chasmanthium laxum var. *sessiliflorum*	Longleaf woodoats
Chasmanthium sp.	Woodoats
Chionanthus virginicus	White fringe tree
Chrysopsis sp.	Golden-aster
Cirsium horridulum	Purple thistle
Cladium jamaicense	Jamaica swamp sawgrass
Clematis reticulata	Netleaf leather flower
Clitoria mariana	Atlantic pigeon-wing
Cnidoscolus stimulosus	Tread-softly
Coelorachis tessellata	Lattice jointgrass
Coleataenia anceps	Beaked panicum
Coleataenia sp.	Panicum
Commelina erecta	Whitemouth dayflower
Commelina sp.	Dayflower
Conyza canadensis	Canadian horseweed
Coreopsis sp.	Tickseed
Cornus asperifolia	Roughleaf dogwood
Cornus florida	Flowering dogwood
Cornus foemina	Swamp dogwood
Crataegus michauxii	Michaux's hawthorn
Crataegus sp.	Hawthorn
Crataegus spathulata	Littlehip hawthorn
Crataegus uniflora	Dwarf hawthorn
Crocanthemum carolinianum	Carolina frostweed
Crocanthemum corymbosum	Pinebarren frostweed
Crocanthemum sp.	Frostweed
Croptilon divaricatum	Slender scratchdaisy
Crotalaria rotundifolia	Rabbitbells
Croton argyranthemus	Silver croton
Croton michauxii	Michaux's croton
Croton sp.	Croton
Cuscuta compacta	Compact dodder

Cyperus odoratus	Fragrant flatsedge
Cyperus ovatus	Pinebarren flatsedge
Cyperus retrofractus	Rough flatsedge
Cyperus sp.	Flatsedge
Dalea pinnata var. *pinnata*	Summer farewell
Dalea sp.	Prairie clover
Decodon verticillatus	Willow-herb
Desmodium canescens	Hoary tick-trefoil
Desmodium floridanum	Florida tick-trefoil
Desmodium marilandicum	Smooth tick-trefoil
Desmodium paniculatum	Fewflower tick-trefoil
Desmodium sp.	Tick-trefoil
Desmodium strictum	Pinebarren tick-trefoil
Dicerandra linearifolia var. *robustior*	Coastalplain balm
Dichanthelium aciculare	Needleleaf witchgrass
Dichanthelium commutatum	Variable witchgrass
Dichanthelium portoricense	Hemlock witchgrass
Dichanthelium sp.	Witchgrass
Dichondra carolinensis	Carolina ponysfoot
Digitaria filiformis	Slender crabgrass
Digitaria sp.	Crabgrass
Diodia sp.	Buttonweed
Diodia virginiana	Virginia buttonweed
Dioscorea floridana	Florida yam
Dioscorea villosa	Wild yam
Diospyros virginiana	Common persimmon
Ditrysinia fruticosa	Gulf sebastian-bush
Drosera brevifolia	Dwarf sundew
Dulichium arundinaceum	Threeway sedge
Dyschoriste oblongifolia	Oblongleaf twinflower
Eclipta prostrata	False daisy
Eleocharis vivipara	Viviparous spikerush
Elephantopus carolinianus	Carolina elephantsfoot
Elephantopus elatus	Tall elephantsfoot
Eragrostis hirsuta	Bigtop lovegrass
Eragrostis sp.	Lovegrass
Eragrostis spectabilis	Purple lovegrass
Erechtites hieraciifolius	Fireweed
Erigeron sp.	Fleabane
Eryngium prostratum	Creeping eryngo

Eryngium yuccifolium	Button rattlesnakemaster
Erythrina herbacea	Coralbean
Eulophia ecristata	Non-crested eulophia
Euonymus americanus	American strawberrybush
Eupatorium album	White thoroughwort
Eupatorium capillifolium	Dogfennel
Eupatorium compositifolium	Yankeeweed
Eupatorium hyssopifolium var. *laciniatum*	Hyssopleaf thoroughwort
Eupatorium leucolepis	Justiceweed
Eupatorium mohrii	Mohr's thoroughwort
Eupatorium perfoliatum	Common boneset
Eupatorium semiserratum	Smallflower thoroughwort
Eupatorium sp.	Thoroughwort
Euphorbia pubentissima	False flowering spurge
Euphorbia sp.	Spurge
Eustachys floridana	Twospike fingergrass
Eustachys glauca	Saltmarsh fingergrass
Eustachys petraea	Pinewoods fingergrass
Eustachys sp.	Fingergrass
Euthamia caroliniana	Slender flattop goldenrod
Forestiera acuminata	Eastern swampprivet
Fraxinus americana	White ash
Froelichia floridana	Cottonweed
Galactia elliottii	Elliott's milkpea
Galactia regularis	Eastern milkpea
Galactia sp.	Milkpea
Galium pilosum	Hairy bedstraw
Galium sp.	Bedstraw
Gaura angustifolia	Southern beeblossom
Gaylussacia dumosa	Dwarf huckleberry
Gaylussacia frondosa var. *tomentosa*	Blue huckleberry
Gelsemium sempervirens	Yellow jessamine
Geobalanus oblongifolius	Gopher apple
Gymnopogon ambiguus	Bearded skeletongrass
Gymnopogon sp.	Skeletongrass
Hamamelis virginiana	American witchhazel
Helianthus angustifolius	Narrowleaf sunflower
Heterotheca subaxillaris	Golden aster
Hexasepalum teres	Poor Joe
Hibiscus aculeatus	Comfortroot

Hieracium gronovii	Queen-devil
Hieracium sp.	Hawkweed
Houstonia procumbens	Roundleaf bluet
Hydrocotyle umbellata	Manyflower marshpennywort
Hymenopappus scabiosaeus	Carolina woollywhite
Hypericum gentianoides	Orangegrass
Hypericum hypericoides	St. Andrew's cross
Hypericum microsepalum	Flatwoods St. John's wort
Hypericum mutilum	Dwarf St. John's wort
Hypericum myrtifolium	Myrtleleaf St. John's wort
Hypericum sp.	St. John's wort
Hypericum suffruticosum	Pineland St. John's wort
Hypericum virginicum	Virginia marsh St. John's wort
Hypoxis curtissii	Common yellow stargrass
Hypoxis sp.	Yellow stargrass
Ilex ambigua	Sand holly
Ilex cassine var. *myrtifolia*	Myrtle-leaved holly
Ilex coriacea	Large gallberry
Ilex glabra	Gallberry
Ilex opaca	American holly
Ilex vomitoria	Yaupon
Indigofera caroliniana	Carolina indigo
Ipomoea cordatotriloba	Tievine
Ipomoea pandurata	Man-of-the-earth
Ipomoea sp.	Morning glory
Itea virginica	Virginia willow
Jacquemontia tamnifolia	Hairy clustervine
Juncus marginatus	Grassleaf rush
Juncus repens	Lesser creeping rush
Juncus scirpoides	Needlepod rush
Kellochloa verrucosa	Warty panicgrass
Kyllinga pumila	Low spikesedge
Lachnocaulon anceps	Whitehead bogbutton
Lactuca canadensis	Canada lettuce
Lactuca floridana	Woodland lettuce
Lechea minor	Thymeleaf pinweed
Lechea mucronata	Hairy pinweed
Lechea sessiliflora	Pineland pinweed
Lechea sp.	Pinweed
Lemna sp.	Duckweed

Lemna valdiviana	Valdivia duckweed
Lepidium virginicum	Virginia pepperweed
Lespedeza angustifolia	Narrowleaf lespedeza
Lespedeza capitata	Roundhead lespedeza
Lespedeza hirta	Hairy lespedeza
Lespedeza repens	Creeping lespedeza
Lespedeza sp.	Lespedeza
Lespedeza stuevei	Tall lespedeza
Lespedeza virginica	Slender lespedeza
Leucothoe axillaris	Coastal doghobble
Liatris elegans	Pinkscale gayfeather
Liatris elegantula	Grassleaf gayfeather
Liatris sp.	Blazing star
Liatris tenuifolia	Shortleaf gayfeather
Limnobium spongia	Frog's-bit
Linaria canadensis	Canadian toadflax
Liquidambar styraciflua	Sweetgum
Lithospermum virginianum	False gromwell
Lobelia puberula	Downy lobelia
Ludwigia arcuata	Piedmont primrosewillow
Ludwigia erecta	Yerba de jicotea
Ludwigia linearis	Narrowleaf primrosewillow
Ludwigia palustris	Marsh seedbox
Ludwigia suffruticosa	Shrubby primrosewillow
Lupinus perennis	Sundial lupine
Lycopodiella appressa	Southern club-moss
Lygodesmia aphylla	Rose-rush
Lyonia lucida	Fetterbush
Magnolia grandiflora	Southern magnolia
Magnolia virginiana	Sweetbay
Matelea floridana	Florida spiny-pod
Matelea gonocarpos	Angle pod
Melothria pendula	Creeping cucumber
Menispermum canadense	Common moonseed
Micranthemum umbrosum	Shade mudflower
Mikania scandens	Climbing hempvine
Mimosa quadrivalvis var. *angustata*	Sensitive briar
Mimosa sp.	Sensitive plant
Mitchella repens	Partridgeberry
Mitreola sessilifolia	Swamp hornpod

Monarda punctata	Spotted beebalm
Morella cerifera	Wax myrtle
Morus rubra	Red mulberry
Muhlenbergia capillaris	Hairawn muhly
Nuphar advena ssp. *advena*	Yellow pondlily
Nyssa sylvatica var. *biflora*	Swamp tupelo
Nyssa sylvatica var. *sylvatica*	Blackgum
Oenothera biennis	Common eveningprimrose
Oenothera laciniata	Cutleaf eveningprimrose
Oldenlandia uniflora	Clustered mille graines
Oplismenus hirtellus	Woodsgrass
Oplismenus setarius	Shortleaf basketgrass
Opuntia austrina	Devil's-tongue
Opuntia sp.	Pricklypear
Osmunda cinnamomea	Cinnamon fern
Osmunda regalis	Royal fern
Ostrya virginiana	Eastern hophornbeam
Oxalis corniculata	Common yellow woodsorrel
Oxalis sp.	Woodsorrel
Palafoxia integrifolia	Coastalplain palafox
Panicum hemitomon	Mountain panic
Panicum sp.	Panic grass
Panicum virgatum	Switchgrass
Paronychia herniarioides	Coastalplain nailwort
Paronychia patula	Pineland nailwort
Parthenocissus quinquefolia	Virginia creeper
Paspalum laeve	Field paspalum
Paspalum setaceum	Thin paspalum
Paspalum sp.	Crowngrass
Passiflora incarnata	Purple passion-flower
Passiflora lutea	Yellow passion-flower
Pediomelum canescens	Buckroot
Penstemon australis	Eustis lake beardtongue
Penstemon multiflorus	Manyflower beardtongue
Penstemon sp.	Beardtongue
Persea palustris	Swamp bay
Persea sp.	Bay
Persicaria hydropiperoides	Swamp smartweed
Phlox floridana	Florida phlox
Phyllanthus caroliniensis	Carolina leaf-flower

Physalis arenicola	Cypresshead groundcherry
Physalis sp.	Groundcherry
Phytolacca americana	American pokeweed
Pinus clausa	Sand pine
Pinus elliottii	Slash pine
Pinus palustris	Longleaf pine
Pinus taeda	Loblolly pine
Piptochaetium avenaceum	Blackseed needlegrass
Piriqueta cistoides ssp. *caroliniana*	Pitted stripeseed
Pityopsis graminifolia	Narrowleaf silkgrass
Planera aquatica	Planer tree
Plantago aristata	Largebract plantain
Plantago virginica	Virginia plantain
Pleopeltis michauxiana	Resurrection fern
Pluchea camphorata	Camphorweed
Poinsettia heterophylla	Fiddler's spurge
Polygala incarnata	Procession flower
Polygala leptostachys	Georgia milkwort
Polygala lutea	Orange milkwort
Polygala nana	Candyroot
Polygonella gracilis	Tall jointweed
Polygonella robusta	Largeflower jointweed
Polygonum hirsutum	Hairy smartweed
Polygonum pinicola	Tall jointweed
Polygonum polygamum	October flower
Polypremum procumbens	Rustweed
Pontederia cordata	Pickerelweed
Portulaca sp.	Purslane
Proserpinaca pectinata	Combleaf mermaidweed
Prunus angustifolia	Chickasaw plum
Prunus caroliniana	Carolina laurelcherry
Prunus serotina	Alabama black cherry
Prunus sp.	Cherry
Prunus umbellata	Flatwoods plum
Pseudognaphalium obtusifolium	Sweet everlasting
Pseudognaphalium sp.	Cudweed
Pteridium aquilinum	Bracken fern
Pteridium aquilinum var. *pseudocaudatum*	Tailed bracken
Pteris sp.	Brake fern
Pterocaulon pycnostachyum	Blackroot

Ptilimnium capillaceum	Mock bishopsweed
Pycnanthemum floridanum	Florida mountain-mint
Pyrrhopappus carolinianus	Carolina desertchicory
Quercus alba	White oak
Quercus falcata	Southern red oak
Quercus geminata	Sand live oak
Quercus hemisphaerica	Laurel oak
Quercus incana	Bluejack oak
Quercus laevis	Turkey oak
Quercus laurifolia	Swamp laurel oak
Quercus margaretta	Sand post oak
Quercus marilandica	Blackjack oak
Quercus michauxii	Swamp chestnut oak
Quercus nigra	Water oak
Quercus pumila	Runner oak
Quercus sp.	Oak
Quercus stellata	Post oak
Quercus virginiana	Live oak
Rhapidophyllum hystrix	Needle palm
Rhexia mariana	Pale meadowbeauty
Rhexia nashii	Maid marian
Rhexia nuttallii	Nuttall's meadowbeauty
Rhododendron viscosum	Swamp azalea
Rhus copallinum	Winged sumac
Rhynchosia difformis	Doubleform snoutbean
Rhynchosia reniformis	Dollarleaf
Rhynchosia sp.	Snoutbean
Rhynchosia tomentosa	Twining snoutbean
Rhynchospora cephalantha	Bunched beaksedge
Rhynchospora fascicularis	Fascicled beaksedge
Rhynchospora rariflora	Fewflower beaksedge
Rhynchospora sp.	Beaksedge
Richardia sp.	Mexican clover
Rubus cuneifolius	Sand blackberry
Rubus flagellaris	Northern dewberry
Rubus pensilvanicus	Sawtooth blackberry
Rubus sp.	Blackberry
Rubus trivialis	Southern dewberry
Rudbeckia hirta	Blackeyed Susan
Ruellia caroliniensis	Carolina wild petunia

Ruellia ciliosa	Ciliate wild petunia
Rumex hastatulus	Heartwing dock
Sabal minor	Bluestem palmetto
Sabatia brevifolia	Shortleaf rosegentian
Saccharum alopecuroides	Silver plumegrass
Saccharum giganteum	Sugarcane plumegrass
Sacciolepis striata	American cupscale
Sagittaria graminea var. *chapmanii*	Chapman's arrowhead
Salix caroliniana	Coastalplain willow
Salix nigra	Black willow
Salvia azurea	Azure blue sage
Salvia lyrata	Lyreleaf sage
Samolus valerandi ssp. *parviflorus*	Pineland pimpernel
Sanicula sp.	Blacksnakeroot
Sassafras albidum	Sassafras
Schizachyrium scoparium	Little bluestem
Schizachyrium stoloniferum	Creeping little bluestem
Scirpus cyperinus	Woolgrass
Scleria ciliata	Curtiss' nutrush
Scleria reticularis	Netted nutrush
Scleria sp.	Nutrush
Scleria triglomerata	Whip nutrush
Scutellaria integrifolia	Helmet skullcap
Senna obtusifolia	Coffeeweed
Serenoa repens	Saw palmetto
Sericocarpus tortifolius	Dixie aster
Sesbania vesicaria	Bladderpod
Setaria corrugata	Coastal foxtail
Setaria parviflora	Knotroot foxtail
Setaria sp.	Bristlegrass; Foxtail
Seymeria pectinata	Piedmont blacksenna
Sideroxylon lanuginosum	Gum bully
Sideroxylon sp.	Bully
Silphium compositum	Kidneyleaf rosinweed
Sisyrinchium nashii	Nash's blue-eyed grass
Smilax auriculata	Earleaf greenbrier
Smilax bona-nox	Saw greenbrier
Smilax glauca	Cat greenbrier
Smilax laurifolia	Laurel greenbrier
Smilax pumila	Sarsaparilla vine

Smilax sp.	Greenbrier
Smilax tamnoides	Bristly greenbrier
Smilax walteri	Coral greenbrier
Solanum carolinense	Carolina horsenettle
Solanum chenopodioides	Black nightshade
Solanum sp.	Nightshade
Solidago odora	Sweet goldenrod
Solidago petiolaris	Downy ragged goldenrod
Solidago sp.	Goldenrod
Sorghastrum elliottii	Slender Indiangrass
Sorghastrum nutans	Yellow Indiangrass
Sorghastrum secundum	Lopsided Indiangrass
Sorghastrum sp.	Indiangrass
Spirodela polyrhiza	Common duckweed
Sporobolus junceus	Pineywoods dropseed
Steinchisma hians	Gaping panicum
Stillingia sylvatica	Queen's delight
Stipulicida setacea	Pineland scalypink
Strophostyles sp.	Fuzzybean
Stylisma humistrata	Southern dawnflower
Stylisma patens	Coastalplain dawnflower
Stylisma sp.	Dawnflower
Stylisma villosa	Hairy dawnflower
Stylosanthes biflora	Sidebeak pencil flower
Symphyotrichum adnatum	Scaleleaf aster
Symphyotrichum dumosum	Rice button aster
Symplocos tinctoria	Horse sugar
Syngonanthus flavidulus	Yellow hatpins
Tephrosia florida	Florida hoary-pea
Tephrosia sp.	Hoary-pea
Tephrosia spicata	Spiked hoary-pea
Tetragonotheca helianthoides	Squarehead
Thaspium barbinode	Hairyjoint meadowparsnip
Tilia americana var. *caroliniana*	Carolina basswood
Tilia sp.	Basswood
Tillandsia usneoides	Spanish moss
Toxicodendron pubescens	Eastern poison oak
Toxicodendron radicans	Eastern poison ivy
Toxicodendron sp.	Poison oak
Trachelospermum difforme	Climbing dogbane

Tradescantia sp.	Spiderwort
Tragia sp.	Noseburn
Tragia urens	Wavyleaf noseburn
Tragia urticifolia	Nettleleaf noseburn
Trichostema dichotomum	Forked bluecurls
Tridens flavus	Purpletop tridens
Triodanis biflora	Small Venus's looking-glass
Triodanis perfoliata	Clasping Venus's looking-glass
Triplasis americana	Perennial sandgrass
Triplasis purpurea	Purple sandgrass
Triplasis sp.	Sandgrass
Tripsacum dactyloides	Eastern gamagrass
Ulmus alata	Winged elm
Ulmus americana	American elm
Utricularia foliosa	Leafy bladderwort
Utricularia subulata	Zigzag bladderwort
Vaccinium arboreum	Sparkleberry
Vaccinium corymbosum	Highbush blueberry
Vaccinium darrowii	Darrow's blueberry
Vaccinium elliottii	Elliott's blueberry
Vaccinium myrsinites	Shiny blueberry
Vaccinium sp.	Blueberry
Vaccinium stamineum	Deerberry
Verbena carnea	Carolina false vervain
Vernonia angustifolia	Tall ironweed
Viburnum nudum	Possumhaw
Viburnum obovatum	Walter's viburnum
Viburnum rufidulum	Rusty blackhaw
Viburnum sp.	Viburnum
Viola lanceolata	Bog white violet
Viola palmata	Early blue violet
Viola sp.	Violet
Viola walteri	Prostrate blue violet
Vitis aestivalis	Summer grape
Vitis cinerea var. *floridana*	Florida grape
Vitis rotundifolia	Muscadine
Vitis shuttleworthii	Calloose grape
Vitis sp.	Grape
Vitis vulpina	Frost grape
Wolffia columbiana	Columbian watermeal

Wolffiella gladiata	Florida mudmidget
Woodwardia areolata	Netted chain fern
Woodwardia virginica	Virginia chain fern
Xyris caroliniana	Carolina yellow-eyed grass
Xyris fimbriata	Fringed yellow-eyed grass
Xyris jupicai	Richard's yellow-eyed grass
Yucca filamentosa	Adam's needle

11.4.2 Native Wildlife Species

Amphibians

Scientific Name	Common Name
Acris gryllus	Southern cricket frog
Ambystoma talpoideum	Mole salamander
Anaxyrus quercicus	Oak toad
Anaxyrus terrestris	Southern toad
Dryophytes cinereus	Green tree frog
Dryophytes gratiosus	Barking tree frog
Dryophytes squirella	Squirrel tree frog
Gastrophryne carolinensis	Eastern narrow-mouthed toad
Hyla femoralis	Pinewoods tree frog
Lithobates catesbeianus	American bullfrog
Lithobates grylio	Pig frog
Lithobates sphenocephalus	Southern leopard frog
Notophthalmus viridescens	Eastern newt
Scaphiopus holbrookii	Eastern spadefoot toad

Birds

Scientific Name	Common Name
Accipiter cooperii	Cooper's hawk
Agelaius phoeniceus	Red-winged blackbird
Aix sponsa	Wood duck
Ardea alba	Great egret
Ardea herodias	Great blue heron
Baeolophus bicolor	Tufted titmouse
Bombycilla cedrorum	Cedar waxwing
Buteo lineatus	Red-shouldered hawk
Cardinalis cardinalis	Northern cardinal
Cathartes aura	Turkey vulture
Catharus guttatus	Hermit thrush

Chordeiles minor	Common nighthawk
Coccyzus americanus	Yellow-billed cuckoo
Colinus virginianus	Northern bobwhite
Contopus virens	Eastern wood-peewee
Coragyps atratus	Black vulture
Corthylio calendula	Ruby-crowned kinglet
Corvus brachyrhynchos	American crow
Cyanocitta cristata	Blue jay
Dryobates pubescens	Downy woodpecker
Dryocopus pileatus	Pileated woodpecker
Dumetella carolinensis	Gray catbird
Egretta thula	Snowy egret
Elanoides forficatus	Swallow-tailed kite
Eudocimus albus	White ibis
Falco sparverius	American kestrel
Gallinago delicata	Wilson's snipe
Geothlypis trichas	Common yellowthroat
Haliaeetus leucocephalus	Bald eagle
Hylocichla mustelina	Wood thrush
Lanius ludovicianus	Loggerhead shrike
Leiothlypis celata	Orange-crowned warbler
Lophodytes cucullatus	Hooded merganser
Megaceryle alcyon	Belted kingfisher
Melanerpes carolinus	Red-bellied woodpecker
Melanerpes erythrocephalus	Red-headed woodpecker
Meleagris gallopavo	Wild turkey
Melospiza georgiana	Swamp sparrow
Melospiza melodia	Song sparrow
Mimus polyglottos	Northern mockingbird
Mniotilta varia	Black-and-white warbler
Molothrus ater	Brown-headed cowbird
Myiarchus crinitus	Great crested flycatcher
Pandion haliaetus	Osprey
Passerina caerulea	Blue grosbeak
Passerina cyanea	Indigo bunting
Peucaea aestivalis	Bachman's sparrow
Pipilo erythrophthalmus	Eastern towhee
Piranga rubra	Summer tanager
Podilymbus podiceps	Pied-billed grebe
Poecile carolinensis	Carolina chickadee

Polioptila caerulea	Blue-gray gnatcatcher
Quiscalus major	Boat-tailed grackle
Regulus satrapa	Golden-crowned kinglet
Sayornis phoebe	Eastern phoebe
Seiurus aurocapilla	Ovenbird
Setophaga americana	Northern parula
Setophaga coronata	Yellow-rumped warbler
Setophaga discolor	Prairie warbler
Setophaga palmarum	Palm warbler
Setophaga pinus	Pine warbler
Sialia sialis	Eastern bluebird
Sitta pusilla	Brown-headed nuthatch
Sphyrapicus varius	Yellow-bellied sapsucker
Spinus tristis	American goldfinch
Spizella passerina	Chipping sparrow
Strix varia	Barred owl
Tachycineta bicolor	Tree swallow
Thryothorus ludovicianus	Carolina wren
Toxostoma rufum	Brown thrasher
Tringa melanoleuca	Greater yellowlegs
Troglodytes aedon	House wren
Turdus migratorius	American robin
Tyrannus tyrannus	Eastern kingbird
Vireo flavifrons	Yellow-throated vireo
Vireo griseus	White-eyed vireo
Vireo olivaceus	Red-eyed vireo
Vireo solitarius	Blue-headed vireo
Zenaida macroura	Mourning dove

Mammals

Scientific Name	**Common Name**
Canis latrans	Coyote
Dasypus novemcinctus	Nine-banded armadillo
Didelphis virginiana	Virginia opossum
Geomys pinetis	Southeastern pocket gopher
Glaucomys volans	Southern flying squirrel
Lontra canadensis	North American river otter
Lynx rufus	Bobcat
Mephitis mephitis	Striped skunk
Neotoma floridana	Eastern woodrat

Odocoileus virginianus	White-tailed deer
Peromyscus gossypinus	Cotton mouse
Podomys floridanus	Florida mouse
Procyon lotor	Raccoon
Scalopus aquaticus	Eastern mole
Sciurus carolinensis	Eastern gray squirrel
Sciurus niger niger	Southern fox squirrel
Sigmodon hispidus	Hispid cotton rat
Spilogale putorius	Eastern spotted skunk
Sylvilagus floridanus	Eastern cottontail
Sylvilagus palustris	Marsh rabbit
Urocyon cinereoargenteus	Gray fox

Reptiles

Scientific Name	Common Name
Agkistrodon conanti	Florida cottonmouth
Alligator mississippiensis	American alligator
Anolis carolinensis	Green anole
Aspidoscelis sexlineata	Six-lined racerunner
Cemophora coccinea copei	Northern scarlet snake
Coluber constrictor priapus	Southern black racer
Crotalus adamanteus	Eastern diamondback rattlesnake
Crotalus horridus	Timber rattlesnake
Deirochelys reticularia reticularia	Eastern chicken turtle
Gopherus polyphemus	Gopher tortoise
Heterodon platirhinos	Eastern hognose
Heterodon simus	Southern hognose
Masticophis flagellum flagellum	Eastern coachwhip
Micrurus fulvius	Coral snake
Nerodia fasciata	Southern water snake; Banded water snake
Pantherophis guttatus	Red rat snake; Corn snake
Pituophis melanoleucus mugitus	Florida pine snake
Plestiodon egregius	Mole skink
Plestiodon inexpectatus	Southeastern five-lined skink
Sceloporus undulatus	Eastern fence lizard
Tantilla relicta neilli	Central Florida crowned snake

Fish

Scientific Name	Common Name
Gambusia holbrooki	Eastern mosquitofish

Crayfish

Scientific Name	Common Name
Procambarus clarkii	Red swamp crayfish

Arthropods

Scientific Name	Common Name
Achurum carinatum	Long-headed toothpick grasshopper
Acmaeodera sp.	Metallic wood-boring beetle
Actias luna	Luna moth
Amblyomma maculatum	Gulf coast tick
Anaea andria	Goatweed leafwing
Anax junius	Green darner
Argyria auratella	Curve-lined argyria moth
Bolitotherus cornutus	Forked fungus beetle
Calopteron discrepans	Banded net-winged beetle
Celithemis eponina	Halloween pennant
Cicindela abdominalis	Eastern pinebarrens tiger beetle
Cicindela punctulata	Punctured tiger beetle
Cicindela scutellaris unicolor	Festive tiger beetle
Erynnis horatius	Horace's duskywing
Erythrodiplax minuscula	Little blue dragonlet
Eutrichota gopheri	Gopher tortoise burrow fly
Gomphaeschna furcillata	Harlequin darner
Hemeroplanis habitalis	Black-dotted hemeroplanis moth
Hermeuptychia sosybius	Carolina satyr
Idia gopheri	Gopher tortoise noctuid moth
Ischnura hastata	Citrine forktail
Junonia coenia	Common buckeye
Laphria floridensis	Bumblebee mimic robber fly
Laphria saffrana	Wasp mimic robber fly
Lethe portlandia	Southern pearly-eye
Limenitis arthemis astyanax	Red-spotted purple
Machimus polyphemi	Gopher tortoise robber fly
Malacosoma americanum	Eastern tent caterpillar moth
Miathyria marcella	Hyacinth glider
Pachydiplax longipennis	Blue dasher
Papilio troilus	Spicebush swallowtail
Phanaeus vindex	Rainbow scarab beetle
Phoebis sennae	Cloudless sulphur

Phyciodes phaon	Phaon crescent
Polites vibex	Whirlabout
Polygonia interrogationis	Question mark
Protographium marcellus	Zebra swallowtail
Pygodasis quadrimaculata	Large four-spotted scolid wasp
Renia fraternalis	Fraternal renia moth
Rhynchophorus cruentatus	Palmetto weevil
Schistocerca americana	American bird grasshopper
Thorybes bathyllus	Southern cloudywing
Tramea carolina	Carolina saddlebags
Urbanus proteus	Long-tailed skipper
Utetheisa ornatrix	Ornate bella moth
Vanessa atalanta	Red admiral

Spiders	
Anasaitis canosa	Twin-flagged jumping spider
Colonus sylvanus	Sylvana jumping spider
Hentzia palmarum	Common hentz jumping spider
Latrodectus mactans	Southern black widow
Pelegrina galathea	Peppered jumping spider
Peucetia viridans	Green lynx spider
Phidippus apacheanus	Apache jumping spider
Phidippus workmani	Workman's jumping spider
Sphodros abbotii	Abbot's purseweb spider
Zygoballus rufipes	Hammerjawed jumping spider

11.5 FNAI Natural Community Descriptions

Natural Community Descriptions

Basin Marsh (1.37 acres, 0.1%)
Basin marshes are regularly inundated, freshwater herbaceous wetlands that may occur in a variety of situations but, in contrast to depression marshes, they are not small or shallow inclusions within a fire-maintained matrix community. Species composition is heterogeneous both within and between marshes but can generally be divided into submersed, floating-leaved, emergent and grassy zones from deepest to shallowest portions; shrub patches may be present within any of these zones. One mostly open water basin marsh is mapped near the eastern boundary at the Suwannee Ridge Wildlife and Environmental Area (SRWEA) and is surrounded by a cypress-dominated dome swamp.

Depression Marsh (13.64 acres, 0.9%)
Depression marshes are isolated, herbaceous wetlands situated in shallow, relatively small and often rounded or oval shaped depressions in fire-maintained landscapes. They are characterized by concentric zones of vegetation that reflect drier, more fluctuating hydrological conditions in the outer rings and wetter conditions proceeding to the center. The substrate is usually acidic sand with deepening peat toward the center. Hydrological conditions vary, with most depression marshes drying in most years. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year. There are six depression marshes all on the eastern side of the property that are mostly embedded in sandhill or upland mixed woodland.

Depression marshes of the SRWEA contain few shrubs and trees, which are found around the perimeter of the community. These woody species include American beautyberry (*Callicarpa americana*), common buttonbush (*Cephalanthus occidentalis*), common persimmon (*Diospyros virginiana*), sweetgum (*Liquidambar styraciflua*), blackgum (*Nyssa sylvatica* var. *sylvatica*), planer tree (*Planera aquatica*), sand live oak (*Quercus geminata*), laurel oak (*Quercus hemisphaerica*), swamp laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), and live oak (*Quercus virginiana*). The sparse herb layer of the depression marshes contain beach false foxglove (*Agalinis fasciculata*), false nettle (*Boehmeria cylindrica*), hairsedge (*Bulbostylis* sp.), witchgrass (*Dichanthelium* sp.), Virginia buttonweed (*Diodia virginiana*), dogfennel (*Eupatorium capillifolium*), yankeeweed (*Eupatorium compositifolium*), orangegrass (*Hypericum gentianoides*), duckweed (*Lemna* sp.), crowngrass (*Paspalum* sp.), purple passion-flower (*Passiflora incarnata*), manyflower beardtongue (*Penstemon multiflorus*), rustweed (*Polypremum procumbens*), and bladderpod (*Sesbania vesicaria*).

Dome Swamp (14.40 acres, 1.0%)
Dome swamps are isolated, forested, depression wetlands occurring within a fire-maintained community such as mesic flatwoods. These swamps are generally small but may also be large and shallow. The characteristic dome shape is created by smaller trees that grow in the shallower waters of the outer edge, while taller trees grow in the deeper water in the interior of the swamp. Dome swamps are most often found on flat terraces, where they develop when the overlying sand

has slumped into a depression in the underlying limestone, creating a rounded depression connected to a shallow water table. In uplands with clay subsoils, dome swamps may occupy depressions over a perched water table. Fire is essential for maintaining the structure and the species composition of a dome swamp community. Without periodic fires cypress may become less dominant as hardwood or bay canopy species increase and peat accumulates.

The young, but well-developed, canopy layer of the dome swamp community at the SRWEA includes red maple (*Acer rubrum*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), and slash pine (*Pinus elliottii*). The sparse, sometimes absent, subcanopy layer includes red maple, swamp bay (*Persea palustris*), water oak, and swamp tupelo. The tall shrub layer is thin and includes fetterbush (*Lyonia lucida*), myrtle-leaved holly (*Ilex cassine* var. *myrtifolia*), and highbush blueberry (*Vaccinium corymbosum*). The variable short shrub layer of the dome swamp community includes Virginia willow (*Itea virginica*), large gallberry (*Ilex coriacea*), coastal doghobble (*Leucothoe axillaris*), and fetterbush. The herbaceous layer includes sedge (*Carex* sp.), threeway sedge (*Dulichium arundinaceum*), duckweed, viviparous spikerush (*Eleocharis vivipara*), sugarcane plumegrass (*Saccharum giganteum*), Virginia marsh St. John's wort (*Hypericum virginicum*), cinnamon fern (*Osmunda cinnamomea*), warty panicgrass (*Kellochloa verrucosa*), sphagnum moss (*Sphagnum* sp.), and Virginia chain fern (*Woodwardia virginica*). Vines were a small component of this community and include cat greenbrier (*Smilax glauca*), laurel greenbrier (*Smilax laurifolia*), and muscadine (*Vitis rotundifolia*).

Disturbances observed in this community include off-road vehicle traffic, fire exclusion, and woody encroachment. No rare plant or animal species have been observed in the SRWEA dome swamps.

Sandhill (1,058.69 acres, 73.6%)
Sandhill communities are characterized by widely spaced pine trees with a sparse midstory of deciduous oaks and a moderate to dense groundcover of grasses, herbs, and low shrubs. Typical associations or indicator species are longleaf pine (*Pinus palustris*), turkey oak (*Quercus laevis*), and wiregrass (*Aristida stricta*). Fire is a dominant environmental factor in sandhill ecology. Frequent low-intensity ground fires in the growing season reduce hardwood competition and perpetuate pines and grasses.

The canopy layer of the sandhill community at the SRWEA is very highly variable in density, depending on recent land management activity. Much of this community has been thinned with widely spaced pines remaining; silvicultural disturbances to the soil and vegetation composition are highly evident. Some areas have not been thinned and remain in dense stands. In a few other areas, there is a canopy of moderately spaced (basal area of approximately 50 to 100) pines occurring in young, even age stands. Canopy species include slash pine and longleaf pine. The subcanopy layer is also highly variable and includes turkey oak, sand post oak (*Quercus margaretta*), sassafras (*Sassafras albidum*), white ash (*Fraxinus americana*), southern red oak (*Quercus falcata*), sweetgum, southern magnolia (*Magnolia grandiflora*), laurel oak, water oak, and live oak. The tall shrub layer is often open enough to easily walk through and includes sweetgum, longleaf pine, swamp laurel oak, sand post oak, live oak, and sassafras. The diverse

short shrub layer of the sandhill community includes devil's walkingstick (*Aralia spinosa*), slimleaf pawpaw (*Asimina angustifolia*), smallflower pawpaw (*Asimina parviflora*), American beautyberry, pignut hickory (*Carya glabra*), common persimmon, flatwoods St. John's wort (*Hypericum microsepalum*), Alabama black cherry (*Prunus serotina*), sand live oak, sand post oak, live oak, winged sumac (*Rhus copallinum*), sassafras, sparkleberry (*Vaccinium arboreum*), highbush blueberry, and deerberry (*Vaccinium stamineum*). The herbaceous layer of the sandhill community is most often weedy at the SRWEA with localized areas of good quality groundcover. Typical species include beach false foxglove, Florida bluestem (*Andropogon floridanus*), wiregrass, ebony spleenwort (*Asplenium platyneuron*), sensitive pea (*Chamaecrista nictitans*), slender woodoats (*Chasmanthium laxum*), summer farewell (*Dalea pinnata* var. *pinnata*), orangegrass, coastalplain balm (*Dicerandra linearifolia* var. *robustior*), witchgrass, crabgrass (*Digitaria* sp.), bigtop lovegrass (*Eragrostis hirsuta*), lovegrass (*Eragrostis* sp.), yankeeweed, slender lespedeza (*Lespedeza virginica*), pinkscale gayfeather (*Liatris elegans*), shortleaf gayfeather (*Liatris tenuifolia* var. *tenuifolia*), panic grass (*Panicum* sp.), purple passion-flower, pitted stripeseed (*Piriqueta cistoides* ssp. *caroliniana*), tall jointweed (*Polygonella gracilis*), bracken fern (*Pteridium aquilinum*), sand blackberry (*Rubus cuneifolius*), bluestem (*Andropogon* sp.), lopsided Indiangrass (*Sorghastrum secundum*), queen's delight (*Stillingia sylvatica*), and forked bluecurls (*Trichostema dichotomum*). Vines can be quite dense in some areas and include peppervine (*Ampelopsis arborea*), yellow jessamine (*Gelsemium sempervirens*), earleaf greenbrier (*Smilax auriculata*), saw greenbrier (*Smilax bona-nox*), cat greenbrier, and muscadine. A healthy population of the rare Florida spiny-pod (*Matelea floridana*) species was observed near a road in sandhill in 2023. No invasive plants were documented in this community. Forestry, fire exclusion, woody encroachment, road, and fire break disturbances are apparent in all sandhill communities at the SRWEA.

Sinkhole (16.89 acres, 1.2%)

Sinkholes are cylindrical or steep-sided conical depressions that are generally formed by the slumping of soil into subterranean cavities or the solution of limestone near the surface. They are common in areas of karst terrain where the underlying limestone is riddled with solution cavities.

Sinkholes at the SRWEA are identified by both the depression and the immediate surrounding upland hardwood forest or upland mixed woodland. The juxtaposition of these two communities maintains their relative suites of plants. The typically closed canopy layer of the sinkhole community includes pignut hickory, sugarberry (*Celtis laevigata*), sweetgum, white oak (*Quercus alba*), southern red oak, laurel oak, swamp laurel oak, swamp chestnut oak (*Quercus michauxii*), and live oak. The subcanopy layer includes sugarberry, sweetgum, swamp laurel oak, Alabama black cherry, swamp chestnut oak, and water oak. The tall shrub layer includes sugarberry, flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), southern magnolia, red mulberry (*Morus rubra*), deerberry, and eastern hophornbeam (*Ostrya virginiana*). The short shrub layer includes American beautyberry, pignut hickory, common buttonbush, hawthorn (*Crataegus* sp.), common persimmon, water oak, and bluestem palmetto (*Sabal minor*). The herbaceous layer is typically sparse, and includes Virginia snakeroot (*Aristolochia serpentaria*), ebony spleenwort, slender woodoats, false nettle, witchgrass, Virginia buttonweed, duckweed, royal fern (*Osmunda regalis*), bracken fern, brake fern (*Pteris* sp.), panic grass, American pokeweed (*Phytolacca*

americana), woodsgrass (*Oplismenus hirtellus*), and sarsaparilla vine (*Smilax pumila*). The epiphytic layer includes infrequent Spanish moss (*Tillandsia usneoides*). Vines include peppervine, Dutchman's pipe (*Aristolochia* sp.), crossvine (*Bignonia capreolata*), southern dewberry (*Rubus trivialis*), earleaf greenbrier, sarsaparilla vine, English ivy (*Hedera helix*), saw greenbrier, and muscadine.

Many of the sinkholes on the SRWEA contain very large trees, steep limestone walls and permanent water, creating spectacular vantage points. Many of the sinkhole communities are surrounded by well-developed, closed canopy upland hardwood forests that contain diverse canopy species assemblages. All the sinkholes are found in the central and western sections of the property. The eastern area of the SRWEA contains dome swamps and depression marshes, likely because the underlying limestone and groundwater are closer to the surface in the eastern areas. This would explain why deep sinkholes have not formed here. Extensive weathering may also have converted ancient sinkholes into present-day depressional wetlands. The condition of these communities appears to be very similar to historic conditions, as determined from 1947 aerial photography.

Upland Hardwood Forest (16.84 acres, 1.2%)

Upland hardwood forest communities are characterized by a well-developed canopy dominated by deciduous hardwood trees occurring on mesic soils. Canopy conditions often restrict air movement and light penetration, resulting in generally humid and mesic conditions throughout.

The closed and often well-developed canopy layer of the upland hardwood forest community at the SRWEA includes pignut hickory, sugarberry, sweetgum, white oak, southern red oak, laurel oak, swamp laurel oak, swamp chestnut oak, and live oak. The subcanopy layer includes sugarberry, sweetgum, swamp laurel oak, Alabama black cherry, swamp chestnut oak, and water oak. The tall shrub layer is often very sparse and includes sugarberry, flowering dogwood, American holly, southern magnolia, red mulberry, deerberry, and eastern hophornbeam. Short shrubs include low percentages of American beautyberry, pignut hickory, hawthorn, common persimmon, water oak, and bluestem palmetto. The herbaceous layer of the upland hardwood forest community includes low amounts of Virginia snakeroot, ebony spleenwort, slender woodoats, false nettle, witchgrass, Virginia buttonweed, bracken fern, American pokeweed, woodsgrass, panic grass, and sarsaparilla vine. The epiphytic layer includes occasional Spanish moss. Vines include peppervine, Dutchman's pipe, crossvine, southern dewberry, earleaf greenbrier, sarsaparilla vine, saw greenbrier, and muscadine.

Upland hardwood forest is found in one area at the SRWEA on the eastern side of the property in association with and around numerous sinkholes. This area also contains a possible state champion American elm (*Ulmus americana*). Disturbances within this community are minimal and restricted to foot trails. Sandhill restoration efforts in the surrounding areas have consisted of clearing vegetation up to the edges of the upland hardwood forest. This is probably the single largest disturbance to this community and has allowed some weedy elements into the forest edges.

Upland Mixed Woodland (103.59 acres, 7.2%)

Upland mixed woodland has an open to partially closed canopy of southern red oak, mockernut hickory (*Carya tomentosa*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), and black oak (*Quercus velutina*), mixed with shortleaf pines (*Pinus echinata*) and longleaf pines. Pignut hickory and white oak may also be present. Upland mixed woodland occurs on loamy soils on drier sites than upland hardwood forest and is often found in the ecotone between upland hardwood forest and frequently burned sandhill or upland pine where fires burn into the hardwood forest edge. Its dominant hardwood species are more resistant to fire than those in the upland hardwood forest and less resistant than those of the sandhills.

The open canopy of the upland mixed woodland community of the SRWEA includes slash pine and longleaf pine. The thin subcanopy also contains mockernut hickory, southern red oak, and sand post oak. The tall shrub layer can be the most developed strata and includes mockernut hickory, sweetgum, winged sumac, swamp laurel oak, and sparkleberry. The short shrub layer includes American beautyberry, bigflower pawpaw (*Asimina obovata*), common persimmon, sweetgum, laurel oak, sand post oak, winged sumac, and sand blackberry. The depauperate herbaceous layer includes slender woodoats, wiregrass, foxtail (*Setaria* sp.), and witchgrass. Vines form small thickets and can be quite dense. Species include earleaf greenbrier, yellow jessamine, and muscadine. Spanish moss was the only epiphyte observed in this community. No rare or non-native plant species have been observed in the upland mixed woodland on SRWEA.

One large area in the western portion of the property is classified as upland mixed woodland. This community is best described as open in structure with only a few species composing the entire community. This area appears as an open forest in historic aerial photography. Due to its landscape position occurring in a broad, dry valley surrounded by sandhill, this area would have received some fire in the past. Other upland mixed woodlands at the SRWEA occur in small patches that border wetlands and sinkholes on the remainder of the property. These areas are differentiated from the surrounding uplands on the 1947 historic photography as having a more prominent hardwood component in the canopy.

Upland mixed woodland probably burned at longer intervals than adjoining sandhill and upland pine, so allowing prescribed fires in the latter to burn into these bordering areas and naturally extinguish would probably be sufficient to maintain them. Where fire-sensitive hardwoods, such as laurel oak, sweetgum, and water oak, have invaded upland mixed woodland in the absence of fire and grown to (fire-proof) tree size, mechanical removal of these invading species may be necessary to open the canopy and allow light to reach the ground layer.

Upland Pine (103.66 acres, 7.2%)

Upland pine communities are a woodland of widely spaced pines with a sparse to moderate shrub layer and a dense, species-rich groundcover of grasses and herbs occurring on gently rolling terrain. Upland pine primarily occurs on the rolling hills of northern Florida north of the Cody Scarp where the soils, classed as ultisols, are composed of sandy loams and loamy sands with clayey subsoils of Miocene and Pleistocene origin. The presence of clay helps retain soil moisture, creating more mesic conditions than are found on the deep sands that support sandhill.

The canopy of upland pine consists of slash pine with no observed subcanopy. Shrubs are short and variable and include American beautyberry, mockernut hickory, coralbean (*Erythrina herbacea*), sweetgum, wax myrtle (*Morella cerifera*), laurel oak, winged sumac, sparkleberry, and Adam's needle (*Yucca filamentosa*). The diverse herbaceous layer is made of a more mesic suite of species than the nearby, and often mixed, sandhill. Herbs include partridge pea (*Chamaecrista fasciculata*), yankeeweed, bracken fern, goldenrod (*Solidago* sp.), and forked bluecurls.

The SRWEA contains some sandhill areas that have strong affinities to an upland pine community. Several ground-truthed areas were newly delineated as upland pine in the 2023 recertified map, but differences between the two are not apparent on the current or historic aerials so detailed delineation across the site is not practical. These areas lack some sandhill obligate species such as the classic indicator, turkey oak. Upland pine is typically in the same landscape position as sandhill (on rolling hills) but has a higher proportion of clay material in the soil. Silt and clay particles in the soil keep available water closer to the surface and alter soil texture and nutrient availability, thereby affecting plant composition. Fire frequencies for both sandhill and upland pine should be the same, every one to three years during the growing season.

Wet Flatwoods (15.53 acres, 1.1%)
Wet flatwoods are open, pine canopy forests with an understory of hydrophytic herbs and shrubs. Wet flatwoods often occur in the ecotones between mesic flatwoods and shrub bogs, wet prairies, dome swamps, or strand swamps. Wet flatwoods also occur in broad, low flatlands, often in a mosaic with these communities. Frequent two to four year burns typically keep the shrub layer sparse and increase the density of herbs.

The canopy layer of the wet flatwoods at the SRWEA is limited to slash pine. Shrubs dominate this community and are mostly two to 15 feet in height and highly variable in density. Species include sweetbay (*Magnolia virginiana*), large gallberry, gallberry (*Ilex glabra*), swamp bay, and swamp azalea (*Rhododendron viscosum*). The herbaceous layer of the wet flatwoods community is sparse and includes bushy bluestem (*Andropogon glomeratus* var. *glomeratus*) and warty panicgrass. Cat greenbrier was the only vine observed. This community occurs as a hillside seepage situation that originates in the sandhill and ends at the down slope dome swamp community. Fire exclusion is apparent by the lack of herbaceous species. Under historic conditions, this community would have a much shorter shrub layer with a higher percentage cover of herbs, primarily wiregrass. Vehicular use in the wet flatwoods should be avoided to prevent soil and hydrological disturbances. The wet flatwoods community should be allowed to burn along with the surrounding sandhill community. Frequent growing season fires will help restore the structure of this area quickly.

Altered Landcover Types

Road (81.11 acres, 5.6%)
The SRWEA has 19.09 miles of unpaved roads throughout the area. Near the entrance of the SRWEA there is a 1.2-mile loop trail.

Successional Hardwood Forest (12.49 acres, 0.9%)

Successional hardwood forests are closed-canopied forests dominated by fast growing hardwoods such as laurel oak, water oak, and sweetgum, often with remnant pines. These forests are either invaded natural habitat (i.e., mesic flatwoods, sandhill, upland pine, upland mixed woodland communities) due to lengthy fire-suppression or old fields that have succeeded to forest.

On the SRWEA, one successional hardwood forest occurs in the northeast corner of the property in an area of former upland mixed woodland. This area has a much denser hardwood canopy than is visible on historic aerial imagery.

11.6 Imperiled Plant Descriptions

Harvest Lice (*Agrimonia incisa*) – Harvest lice is an herbaceous perennial with hairy leaves and stems that is often considered a sandhill species. However, this species also occurs in open areas in scrub, upland pine, and upland mixed woodland. Harvest lice requires growing season fires that reduce the encroachment of woody species and create open areas allowing sunlight to reach the ground. It responds positively to fire by demonstrating a more vigorous growth the season after a fire, and it tends to decrease as the amount of time post-fire increases. Altered fire regimes and fire suppression negatively affect this species; therefore, application of prescribed fire varies by season, frequency, and fire intensity to ensure species diversity. Allowing fire from adjacent, more frequently burned communities to enter and extinguish naturally in scrub and ecotones benefits this species. Scrub management programs should strive to mimic natural processes that create the openings this species prefers. While this species' tall, dry stems and withered leaves are visible all year, the best time for conducting surveys or verifying species identity is during flowering, which occurs primarily from late July to November.

Non-crested Eulophia (*Eulophia ecristata*) - Non-crested eulophia is a perennial, deciduous herb that prefers open areas with filtered sunlight and no dense shrub competition in mesic flatwoods, pine rockland, sandhill, scrub, scrubby flatwoods, and wet flatwoods. While this species may persist for long periods in xeric habitats without fire, occasional fire is needed to reduce competition and shading by shrubs. However, non-crested eulophia is dependent on frequent fire in moist habitats that experience rapid shrub growth, so prescribed fire should occur with a frequency that will create or maintain open areas, limit the shrub layer, and encourage diverse herbaceous cover. Excessive site preparation and illegal collecting negatively affect this species; therefore, protect areas with known occurrences. Flowering, which occurs from July to September, or fruiting, which occurs from September to November, is the best time for conducting surveys or verifying species identity.

Florida Spiny-pod (*Matelea floridana*) - Florida spiny-pod prefers to grow and flower in moist well-drained soils and sunny or semi-shaded areas in mesic hammock, upland mixed woodland, and upland pine communities. However, Florida spiny-pod is also able to grow and flower in full shade. This species requires occasional fire to maintain and promote the open grassy habitats that it favors, with most fire occurring during the growing season. Since Florida spiny-pod is difficult to distinguish from closely related species without flowers or fruits, flowering or fruiting is the best time for conducting surveys or verifying species identity. Florida spiny-pod flowers from May to

July, and fruiting occurs from August to October. This species may be distinguished from other, similar species by its black, cup-shaped, appendaged corona, its maroon petals, and its lance shaped fruits that are covered in fleshy spines. Altered fire regimes, fire suppression, and hydrologic disturbances negatively affect this species; therefore, it is important to avoid constructing fire breaks in ecotones, restore ecotones by removing existing roads and fire breaks, and maintain and restore the natural hydrology.

Angle Pod (*Matelea gonocarpos*) - Angle pod is an herbaceous, perennial vine and like other members of the *Matelea* genus, their leaves and stems produce a milky sap when cut or injured. This species prefers moist, well-drained, sunny or semi-shaded areas in alluvial forest, basin swamp, baygall, blackwater stream, bottomland forest, hydric hammock, maritime hammock, mesic hammock, shell mound, upland hardwood forest, and upland pine communities. Angle pod may occur along wooded roadsides and on the edges of sinkholes. Even though angle pod occurs in upland pine communities which require frequent fire (two to three years), it is sensitive to fire, surviving in fire shadows. Managers should vary the seasonality and severity of prescribed burns and allow prescribed fires from adjacent fire-maintained communities to naturally burn into and naturally extinguish in its preferred communities. Since angle pod is difficult to distinguish from other similar species without flowers or fruits, flowering or fruiting is the best time for conducting surveys or verifying species identity. Angle pod flowers from June to August and fruits from August to October. Staff may be able to distinguish this species from other similar species by its yellow or greenish-brown petals without a network of veins and its lance shaped fruits that are smooth. Soil and hydrologic disturbances negatively affect this species; therefore, limit the impact of disruptive activities and maintain and restore the natural hydrology where practicable.

Cinnamon Fern (*Osmunda cinnamomea*) and Royal Fern (*O. regalis*) - These ferns, state Commercially Exploited, are terrestrial ferns that occur in many natural communities in Florida, both wet and dry. While these species grow in many communities that the Florida Fish and Wildlife Conservation Commission does not typically actively manage, if conducting management activities near known occurrences, staff make efforts to protect known occurrences from chemical and mechanical treatments. These species do not require fire. However, some of the natural communities in which these species occur are fire adapted, and these ferns resprout after fire. Illegal collecting and hydrological disturbances negatively affect these species; therefore, protect areas with known occurrences and maintain and restore the natural hydrology where practicable. Since fronds are present year-round, these species can be identified throughout the year.

Florida Mountain-mint (*Pycnanthemum floridanum*) - Florida mountain-mint is a shrub-like perennial herb that prefers open to partial shaded areas in sandhills, upland mixed woodland, upland pines, mesic hammock, and the ecotone between upland hardwood forest and pinelands. This species also occurs in mesic and wet flatwoods and along roadside ditches. It is unclear if Florida mountain-mint requires fire for its survival. However, most of this species' preferred habitats require fire, so apply prescribed fire that ensures species diversity and creates mosaic habitats. Also, allow prescribed fire from adjacent communities to burn into and extinguish naturally in ecotones when feasible. Hydrological disturbances and fire suppression negatively affect this species' preferred habitats; therefore, maintain and restore the natural hydrology where

practicable, and prescribed fire should occur with a frequency that will create or maintain open areas, limit the shrub layer, and encourage diverse herbaceous cover. Flowering, which occurs from July to August, is the best time for conducting surveys or verifying species identity.

Needle Palm (*Rhapidophyllum hystrix*) – Needle palm is a small shrubby palm that prefers basin swamp, bottomland forest, floodplain swamp, hydric hammock, mesic hammock, sinkhole, slope forest, and upland hardwoods forest. Even though this species is not fire tolerant, due to habitat management, allow fire to naturally enter and extinguish within needle palm habitats when feasible. Illegal collecting and habitat alteration negatively affect this species; therefore, protect known occurrences and ensure not to negatively influence areas with known occurrences. Surveys or species identification may occur throughout the year for this species.

11.7 FNAI Natural Inventory Ranking Systems and Definitions

Elements and Element Occurrences

An **element** is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature.

An **element occurrence (EO)** is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.

Element Ranking and Legal Status

Using a ranking system developed by NatureServe and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks for each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element Occurrences (EOs), estimated abundance (number of individuals for species; area for natural communities), geographic range, estimated number of adequately protected EOs, relative threat of destruction, and ecological fragility.

FNAI GLOBAL ELEMENT RANK

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4 = Apparently secure globally (may be rare in parts of range).
G5 = Demonstrably secure globally.
GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
GX = Believed to be extinct throughout range.
GXC = Extirpated from the wild but still known from captivity or cultivation.
G#? = Tentative rank (e.g., G2?).
G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).
G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
G#T#Q = Same as above, but validity as subspecies or variety is questioned.
GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
GNR = Element not yet ranked (temporary).
GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI STATE ELEMENT RANK

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.
SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
SX = Believed to be extirpated throughout Florida.
SU = Unrankable; due to a lack of information no rank or range can be assigned.
SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

Legal status information provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
E = Endangered: species in danger of extinction throughout all or a significant portion of its range.
E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas
E, PDL = Species currently listed endangered but has been proposed for delisting.
E, PT = Species currently listed endangered but has been proposed for listing as threatened.
E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.
T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
PE = Species proposed for listing as endangered.
PS = - An infraspecific taxon or population has federal status but the entire species does not - status is in only a portion of the species range.
PT = Species proposed for listing as threatened.
SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
SC = Not currently listed, but considered a "species of concern" to USFWS.
DL = Delisted.
UR = Under review.

STATE LEGAL STATUS

Provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant state agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service
FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service
FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service
FXN = Federal listed as an experimental population in Florida
FT(S/A) = Federal Threatened due to similarity of appearance
ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for Pandion haliaetus (Osprey) indicates that this status applies in Monroe county only.)
N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011, 581.185 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: https://www.flrules.org/gateway/ChapterHome.asp?Chapter=5B-40.

E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
CE = Commercially exploited: species native to the state which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.
N = Not currently listed, nor currently being considered for listing.

Element Occurrence Ranking

FNAI ranks of quality of the element occurrence in terms of its viability (EORANK). Viability is estimated using a combination of factors that contribute to continued survival of the element at the location. Among these are the size of the EO, general condition of the EO at the site, and the conditions of the landscape surrounding the EO (e.g. an immediate threat to an EO by local development pressure could lower an EO rank).

A = Excellent estimated viability
A? = Possibly excellent estimated viability
AB = Excellent or good estimated viability
AC = Excellent, good, or fair estimated viability
B = Good estimated viability
B? = Possibly good estimated viability
BC = Good or fair estimated viability
BD = Good, fair, or poor estimated viability
C = Fair estimated viability
C? = Possibly fair estimated viability
CD = Fair or poor estimated viability
D = Poor estimated viability
D? = Possibly poor estimated viability
E = Verified extant (viability not assessed)
F = Failed to find
H = Historical
NR = Not ranked, a placeholder when an EO is not (yet) ranked.
U = Unrankable
X = Extirpated

*For additional detail on the above ranks see: http://www.natureserve.org/explorer/eorankguide.htm

FNAI also uses the following EO ranks:

H? = Possibly historical
F? = Possibly failed to find
X? = Possibly extirpated

The following offers further explanation of the H and X ranks as they are used by FNAI:

The rank of H is used when there is a lack of recent field information verifying the continued existence of an EO, such as (a) when an EO is based only on historical collections data; or (b) when an EO was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area. This definition of the H rank is dependent on an interpretation of what constitutes "recent" field information. Generally, if there is no known survey of an EO within the last 20 to 40 years, it should be assigned an H rank. While these time frames represent suggested maximum limits, the actual time period for historical EOs may vary according to the biology of the element and the specific landscape context of each occurrence (including anthropogenic alteration of the environment). Thus, an H rank may be assigned to an EO before the maximum time frames have lapsed. Occurrences that have not been surveyed for periods exceeding these time frames should not be ranked A, B, C, or D. The higher maximum limit for plants and communities (i.e., ranging from 20 to 40 years) is based upon the assumption that occurrences of these elements generally have the potential to persist at a given location for longer periods of time. This greater potential is a reflection of plant biology and community dynamics. However, landscape factors must also be considered. Thus, areas with more anthropogenic impacts on the environment (e.g., development) will be at the lower end of the range, and less-impacted areas will be at the higher end.

The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).

11.8 Soil Series Descriptions

Map Unit Description

Hamilton County, Florida

[Minor map unit components are excluded from this report]

Map unit: 2 - Albany fine sand, 0 to 5 percent slopes

Component: Albany (90%)

The Albany component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 4 - Alpin sand, 5 to 8 percent slopes

Component: Alpin (90%)

The Alpin component makes up 90 percent of the map unit. Slopes are 5 to 8 percent. This component is on marine terraces on coastal plains, hillslopes. The parent material consists of eolian deposits or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 5 - Blanton sand, 0 to 5 percent slopes

Component: Blanton (90%)

The Blanton component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during March, April, May, June, July, August. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 8 - Chipley sand, 0 to 5 percent slopes

Component: Chipley (90%)

The Chipley component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on flats on marine terraces on coastal plains, rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 9 - Foxworth sand, 0 to 5 percent slopes

Component: Foxworth (95%)

The Foxworth component makes up 95 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or

Map Unit Description

Hamilton County, Florida

Map unit: 9 - Foxworth sand, 0 to 5 percent slopes

Component: Foxworth (95%)

restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. Irrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Map unit: 20 - Pamlico muck, depressional

Component: Pamlico (90%)

The Pamlico component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 50 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 21 - Plummer and Surrency soils, depressional

Component: Plummer, depressional (50%)

The Plummer, depressional component makes up 50 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Surrency, depressional (33%)

The Surrency, depressional component makes up 33 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 15 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 24 - Ocilla loamy fine sand, 0 to 5 percent slopes

Component: Ocilla (90%)

The Ocilla component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Hamilton County, Florida

Map unit: 33 - Pelham sand

Component: Pelham, non-hydric (60%)

The Pelham, non-hydric component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 5w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pelham, hydric (30%)

The Pelham, hydric component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 34 - Plummer sand

Component: Plummer, non-hydric (60%)

The Plummer, non-hydric component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, June, July, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Plummer, hydric (30%)

The Plummer, hydric component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 35 - Wahee fine sandy loam, 0 to 4 percent slopes, occasionally flooded

Component: Wahee (90%)

The Wahee component makes up 90 percent of the map unit. Slopes are 0 to 4 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

Hamilton County, Florida

Map unit: 36 - Blanton fine sand, 0 to 5 percent slopes, occasionally flooded

Component: Blanton (90%)

The Blanton component makes up 90 percent of the map unit. Slopes are 0 to 5 percent. This component is on stream terraces on marine terraces, coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 66 inches during March, April, May, June, July, August. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 58 - Sapelo sand

Component: Sapelo, non-hydric (75%)

The Sapelo, non-hydric component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Sapelo, hydric (15%)

The Sapelo, hydric component makes up 15 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

11.9 Land Management Review

2021 Land Management Review Team Report for Suwannee Ridge Wildlife and Environmental Area

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Introduction

Section 259.036, F.S. requires a periodic on-site review of conservation and recreation lands titled in the name of the Board of Trustees to determine (1) whether the lands are being managed for the purposes for which they were acquired and (2) whether they are being managed in accordance with their land management plan adopted pursuant to s. 259.032, F.S. In cases where the managed areas exceed 1,000 acres in size, such a review must be scheduled at least every five years. In conducting this review, a statutorily constructed review team "shall evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan."

The land management review teams are coordinated by the Division of State Lands and consist of representatives from the Division of Recreation and Parks (DEP), the Florida Forest Service (DACS), the Fish and Wildlife Conservation Commission, the local government in which the property is located, the DEP District in which the parcel is located, the local soil and water conservation district or jurisdictional water management district, a conservation organization member, and a local private land manager.

Each Land Management Review Report is divided into three sections. Section 1 provides the details of the property being reviewed as well as the overall results of the report. Section 2 provides details of the Field Review, in which the Review Team inspects the results of management actions on the site. Section 3 provides details of the Land Management Plan Review, in which the team determines the extent to which the Management Plan provides for and documents adequate natural and recreational resource protection.

Finally, each report may also contain an Appendix that lists individual team member comments. This is a compilation of feedback, concerns or other thoughts raised by individual team members, but not necessarily indicative of the final consensus reached by the Land Management Review Team.

Property Reviewed in this Report

Name of Site: Suwannee Ridge Wildlife and Environmental Area
Managed by: Florida Fish and Wildlife Conservation Commission
Acres: 1,429 **County:** Hamilton
Purpose(s) for Acquisition: Restore and conserve optimum habitat for rare and imperiled wildlife populations, principally, the gopher tortoise and associated species, and to provide compatible fish and wildlife based public outdoor recreation, environmental education and research opportunities.
Acquisition Program(s): Fish & Wildlife Habitat **Original Acquisition Date:** 6/26/02
Area Reviewed: Entire Property **Last Management Plan Approval Date:** 12/23/15
Review Date: 9/1/21

Agency Manager and Key Staff:

- Matthew Barker, Manager
- Rebecca Doane
- Scott Johns, District Biologist
- Ash Ehlers

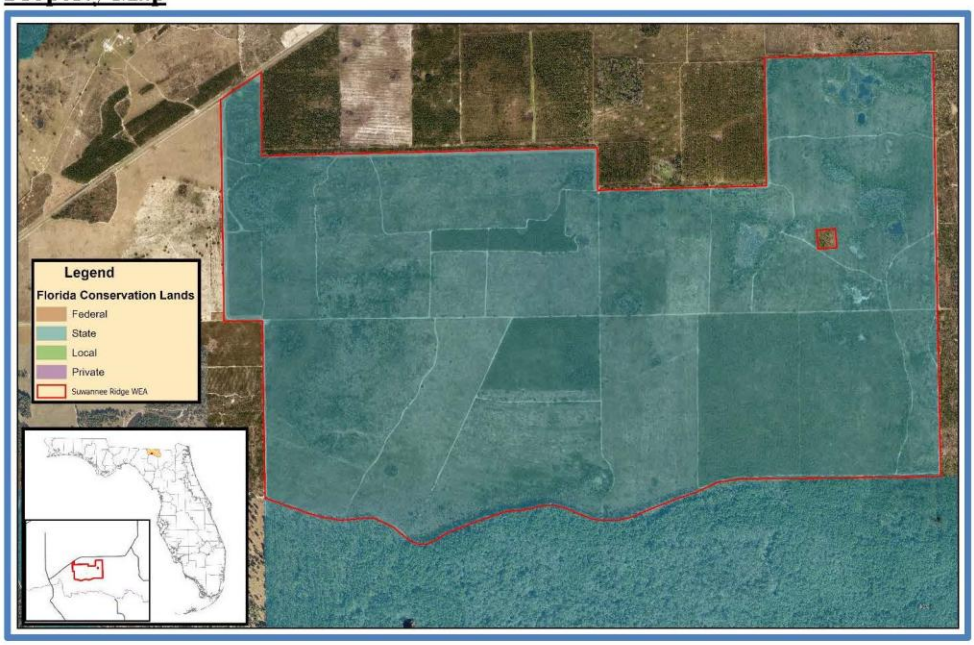
Review Team Members (voting)

- Keith Morin, DRP District
- Local Gov't., None
- Scotland Talley, FWC
- Jason Neumann, DEP District
- Shelly Wayte, FFS
- Steven Carpenter, SRWMD
- Walter Bryant, Conservation Org.
- Private Land Manager, None

Non-Team Members (attending)

- Keith Singleton, DEP/DSL

Property Map



Overview of Land Management Review Results

Is the property managed for purposes that are compatible with conservation, preservation, or recreation?

Yes = 6, No = 0

Are the management practices, including public access, in compliance with the management plan?

Yes = 6, No = 0

Table 1 shows the average scores received for each applicable category of review. *Field Review* scores refer to the adequacy of management actions in the field, while *Management Plan Review* scores refer to adequacy of discussion of these topics in the management plan. Scores range from 1 to 5 with 5 signifying excellence. For a more detailed key to the scores, please see *Appendix A*.

Table 1: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	4.70	4.67
Prescribed Fire / Habitat Restoration	4.78	4.89
Hydrology	4.44	4.22
Imperiled Species	4.92	4.70
Exotic / Invasive Species	4.72	4.64
Cultural Resources	4.58	4.50
Public Access / Education / Law Enforcement	4.54	4.50
Infrastructure / Equipment / Staffing	4.40	N/A

Color Code (See Appendix A for detail)

Excellent	Above Average	Below Average	Poor

Consensus Commendations for the Managing Agency

The following commendations resulted from discussion and vote of the review team members:

1. The team commends the staff on increasing the amoun of prescribed fire in this cycle and integrating prescribed fire into the overall sandhill restoration strategy. (6+, 0-)
2. The team commends the staff for working with partners to provide mobilitity-impaired limited hunting opportunities. (6+, 0-)
3. The team commends the staff for efforts in completing the timber inventory of the property (6+, 0-)

Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The next management plan update should include information about how these recommendations have been addressed:

1. The team recommends that before the next management plan to determine how much of the sandhill area is actually upland pine desired future condition and how much of the mesic hammock is upland mixed forest desired future condition through FNAI survey, soil typing and other means. (6+, 0-)
   Managing Agency Response:

Field Review Details

Field Review Checklist Findings

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

1. **Natural communities, specifically depression marsh, dome swamp, mesic hammock, sinkhole, upland hardwood forest, and wet flatwoods.**
2. **Listed species, listed animal and plant species in general, and specifically gopher tortoise.**
3. **Natural resources survey/monitoring resources; specifically listed species or their habitat monitoring, other non-game species or their habitat monitoring, fire effects monitoring, other habitat management effects monitoring, and invasive species survey and monitoring.**
4. **Cultural resources, specifically cultural resource survey, and protection and preservation.**
5. **Prescribed fire, specifically area being burned, frequency and quality.**
6. **Restoration, specifically sandhill restoration.**
7. **Forest management, specifically timber inventory, and timber harvesting.**
8. **Non-native, invasive, and problem species, specifically prevention and control of plants, animals, and pests/pathogens.**
9. **Hydro-alteration, specifically roads and culverts.**
10. **Ground Water Monitoring, specifically quality, and quantity.**
11. **Surface Water Monitoring, specifically quality, and quantity.**
12. **Resource protection, specifically boundary survey, gates and fencing, signage and law enforcement presence.**
13. **Adjacent property concerns, specifically inholdings and additions.**
14. **Public access, specifically roads, and parking.**
15. **Environmental education and outreach, specifically wildlife, invasive species, habitat management activities, interpretive facilities and signs, recreational opportunities, and management of visitor impacts.**
16. **Management resources, specifically waste disposal, sanitary facilities, buildings, equipment, staff, and funding.**

Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 3.0 score on average). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The management plan update should include information on how these items have been addressed:

The review team scores did not identify items requiring improvement actions in the field.

Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	

Natural Communities (I.A)										
Depression Marsh	I.A.1	5	5	5	5	5	5			5.00
Dome Swamp	I.A.2	5	5	5	5	5	5			5.00
Mesic Hammock	I.A.3	3	3	5	5	5	5			4.33
Sandhill	I.A.4	3	3	4	5	4	4			3.83
Sinkhole	I.A.5	5	5	5	5	5	5			5.00
Upland Hardwood Forest	I.A.6	5	3	5	5	5	5			4.67
Wet Flatwoods	I.A.7	4	4	5	5	5	5			4.67
								Natural Communities Average Score		4.64
Listed species: Protection & Preservation (I.B)										
Animals	I.B.1		5		5	5	5			5.00
Gopher Tortoise	I.B.1.a	5	5	5	5	5	5			5.00
Plants	I.B.2		5		5	4	5			4.75
								Listed Species Average Score		4.92
Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	5	5	4	5	4	5			4.67
Other non-game species or their habitat monitoring	I.C.3	3	5	4	5	5	5			4.50
Fire effects monitoring	I.C.4	3	5	5	5	5	5			4.67
Other habitat management effects monitoring	I.C.5	4	5	4	5	5	5			4.67
Invasive species survey / monitoring	I.C.6	4	5	5	5	5	5			4.83
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	4	4	4	5	5	5			4.50
Protection and preservation	II.B	5	4	4	5	5	5			4.67
								Cultural Resources Average Score		4.58
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	5	5	5	5	5	5			5.00
Frequency	III.A.2	4	5	5	5	5	5			4.83
Quality	III.A.3	4	5	5	5	5	5			4.83
								Resource Management, Prescribed Fire Average Score		4.89
Restoration (III.B)										
Sandhill	III.B.1	5	5	4	5	4	5			4.67
								Restoration Average Score		4.67
Forest Management (III.C)										
Timber Inventory	III.C.1	5	5	4	5	5	5			4.83
Timber Harvesting	III.C.2	4	5	4	5	5	5			4.67
								Forest Management Average Score		4.75
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	5	5	5	5	5	5			5.00
prevention - animals	III.D.1.b	4	4	5	5	5	5			4.67
prevention - pests/pathogens	III.D.1.c	4	4	4	5	5	5			4.50
Control										
control - plants	III.D.2.a	4	5	5	5	5	5			4.83

control - animals	III.D.2.b	5	4	5	5	5	5			4.83
control - pests/pathogens	III.D.2.c	4	4	4	5	5	5			4.50
								Non-Native, Invasive & Problem Species Average Score		4.72
Hydrologic/Geologic function Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	4	5	4	5	5	5			4.67
								Hydrologic/Geologic function, Hydro-Alteration Average Score		4.67
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	4	3	4	5	5	5			4.33
Ground water quantity	III.E.2.b	4	3	4	5	5	5			4.33
								Ground Water Monitoring Average Score		4.33
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	4	3	4	5	5	5			4.33
Surface water quantity	III.F.3.b	4	3	4	5	5	5			4.33
								Surface Water Monitoring Average Score		4.33
Resource Protection (III.F)										
Boundary survey	III.F.1	3	4	5	5	5	5			4.50
Gates & fencing	III.F.2	5	4	5	5	5	5			4.83
Signage	III.F.3	5	4	5	5	5	5			4.83
Law enforcement presence	III.F.4	4	4	4	5	5	5			4.50
								Resource Protection Average Score		4.67
Adjacent Property Concerns (III.G)										
Land Use										
Inholdings/additions	III.G.2		4	5		5	5			4.75
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	4	5	5	5	5	5			4.83
Parking	IV.1.b	3	5	5	5	5	5			4.67
Environmental Education & Outreach										
Wildlife	IV.2.a	3	4	5	5	4	5			4.33
Invasive Species	IV.2.b	3	4	4	5	4	5			4.17
Habitat Management Activities	IV.2.c	3	4	5	5	4	5			4.33
Interpretive facilities and signs	IV.3	3	4	5	5	3	5			4.17
Recreational Opportunities	IV.4	3	4	5	5	3	5			4.17
Management of Visitor Impacts	IV.5	4	4	5	5	5	5			4.67
								Public Access & Education Average Score		4.42
Management Resources (V.1, V.2, V.3. V.4)										
Maintenance										
Waste disposal	V.1.a	4	4	4	X	5	5			4.40
Sanitary facilities	V.1.b	4	X	4	X	5	5			4.50
Infrastructure										
Buildings	V.2.a	3	4	4	5	5	5			4.33
Equipment	V.2.b	2	4	4	5	5	5			4.17
Staff	V.3	3	4	4	5	5	5			4.33
Funding	V.4	4	5	4	5	5	5			4.67

				Management Resources Average Score	4.40
Color Code:	Excellent	Above Average	Below Average	Poor	See Appendix A for detail
		Missing Vote	Insufficient Information		

Land Management Plan Review Details

Items Requiring Improvements in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than 3.0 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The next management plan update should address the checklist items identified below:

The review team scores did not identify items requiring improvements in the management plan.

Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Depression Marsh	I.A.1	4	4	4	5	5	5			4.50
Dome Swamp	I.A.2	4	4	4	5	5	5			4.50
Mesic Hammock	I.A.3	4	4	4	5	5	5			4.50
Sandhill	I.A.4	5	5	4	5	5	5			4.83
Sinkhole	I.A.5	4	4	5	5	5	5			4.67
Upland Hardwood Forest	I.A.6	4	4	5	5	5	5			4.67
Wet Flatwoods	I.A.7	4	4	4	5	5	5			4.50
									Natural Communities Average Score	4.60
Listed species: Protection & Preservation (I.B)										
Animals	I.B.1	4	4		5	5	5			4.60
Gopher Tortoise	I.B.1.a	5	5	5	5	5	5			5.00
Plants	I.B.2		4		5	4	5			4.50
									Listed Species Average Score	4.70
Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	5	4	4	5	4	5			4.50
Other non-game species or their habitat monitoring	I.C.3	4	4	4	5	5	5			4.50
Fire effects monitoring	I.C.4	4	4	5	5	5	5			4.67
Other habitat management effects monitoring	I.C.5	3	4	4	5	5	5			4.33
Invasive species survey / monitoring	I.C.6	4	4	5	5	5	5			4.67

Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	4	4	4	5	5	5			4.50
Protection and preservation	II.B	4	4	4	5	5	5			4.50
									Cultural Resources Average Score	4.50
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	5	5	5	5	5	5			5.00
Frequency	III.A.2	5	5	5	5	5	5			5.00
Quality	III.A.3	4	5	5	5	5	5			4.83
									Resource Management, Prescribed Fire Average Score	4.94
Restoration (III.B)										
Sandhill	III.B.1	5	5	4	5	5	5			4.83
									Restoration Average Score	4.83
Forest Management (III.C)										
Timber Inventory	III.C.1	5	5	4	5	5	5			4.83
Timber Harvesting	III.C.2	4	5	4	5	5	5			4.67
									Forest Management Average Score	4.75
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	4	5	5	5	5	5			4.83
prevention - animals	III.D.1.b	4	4	5	5	5	5			4.67
prevention - pests/pathogens	III.D.1.c	3	4	4	5	5	5			4.33
Control										
control - plants	III.D.2.a	5	5	5	5	5	5			5.00
control - animals	III.D.2.b	3	4	5	5	5	5			4.50
control - pests/pathogens	III.D.2.c	4	4	4	5	5	5			4.50
									Non-Native, Invasive & Problem Species Average Score	4.64
Hydrologic/Geologic function, Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	3	4	4	5	5	5			4.33
									Hydrologic/Geologic function, Hydro-Alteration Average Score	4.33
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	3	3	4	5	5	5			4.17
Ground water quantity	III.E.2.b	3	3	4	5	5	5			4.17
									Ground Water Monitoring Average Score	4.17
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	3	3	4	5	5	5			4.17
Surface water quantity	III.E.3.b	3	3	4	5	5	5			4.17
									Surface Water Monitoring Average Score	4.17
Resource Protection (III.F)										
Boundary survey	III.F.1	3	4	5	5	5	5			4.50
Gates & fencing	III.F.2	4	4	5	5	5	5			4.67
Signage	III.F.3	4	4	5	5	5	5			4.67
Law enforcement presence	III.F.4	3	4	4	5	5	5			4.33
									Resource Protection Average Score	4.54

Adjacent Property Concerns (III.G)										
Land Use										
Inholdings/additions	III.G.2	5	4	5	5	5	5			4.83
Discussion of Potential Surplus Land Determination	III.G.3	4	4	5	5	5	5			4.67
Surplus Lands Identified?	III.G.4	5	4	5	5	5	5			4.83
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	5	4	4	5	4	5			4.50
Parking	IV.1.b	4	4	4	5	5	5			4.50
Environmental Education & Outreach										
Wildlife	IV.2.a	4	4	4	5	5				4.40
Invasive Species	IV.2.b	3	4	4	5	5				4.20
Habitat Management Activities	IV.2.c	3	4	4	5	5				4.20
Interpretive facilities and signs	IV.3	4	4	5	5	5				4.60
Recreational Opportunities	IV.4	4	4	5	5	5				4.60
Management of Visitor Impacts	IV.5	4	4	5	5	5				4.60
								Public Access & Education Average Score		4.45
Managed Area Uses (VI.A, VI.B)										
Existing Uses										
Wildlife Viewing	VI.A.1	4	4	4	5	5	5			4.50
Hunting	VI.A.2	4	5	4	5	5	5			4.67
Hiking	VI.A.3	5	4	4	5	5	5			4.67

Color Code:	Excellent	Above Average	Below Average	Poor	See Appendix A for detail
		Missing Vote	Insufficient Information		

Appendix A: Scoring System Detail

Explanation of Consensus Commendations:

Often, the exceptional condition of some of the property's attributes impress review team members. In those instances, team members are encouraged to offer positive feedback to the managing agency in the form of a commendation. The teams develop commendations generally by standard consensus processes or by majority vote if they cannot obtain a true consensus.

Explanation of Consensus Recommendations:

Subsection 259.036(2), F.S., specifically states that the managing entity shall consider the findings and recommendations of the land management review. We ask team members to provide general recommendations for improving the management or public access and use of the property. The teams discuss these recommendations and develop consensus recommendations as described above. We provide these recommendations to the managing agency to consider when finalizing the required ten-year management plan update. We encourage the manager to respond directly to these recommendations and include their responses in the final report when received in a timely manner.

Explanation of Field Review Checklist and Scores, and Management Plan Review Checklist and Scores:

We provide team members with a checklist to fill out during the evaluation workshop phase of the Land Management Review. The checklist is the uniform tool used to evaluate both the management actions and condition of the managed area, and the sufficiency of the management plan elements. During the evaluation workshop, team members individually provide scores on each issue on the checklist, from their individual perspective. Team members also base their evaluations on information provided by the managing agency staff as well as other team member discussions. Staff averages these scores to evaluate the overall conditions on the ground, and how the management plan addresses the issues. Team members must score each management issue 1 to 5: 1 being the management practices are clearly insufficient, and 5 being that the management practices are excellent. Members may choose to abstain if they have inadequate expertise or information to make a cardinal numeric choice, as indicated by an "X" on the checklist scores, or they may not provide a vote for other unknown reasons, as indicated by a blank. If a majority of members failed to vote on any issue, that issue is determined to be irrelevant to management of that property or it was inadequately reviewed by the team to make an intelligent choice. In either case staff eliminated the issue from the report to the manager.

Average scores are interpreted as follows:

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*

11.10 Management Plan Terms

Management Plan Goals and Objectives
Terms and Definitions

Assessment: Assessment—when a historic resource professional determines the possible effects—positive or negative—that an action or inaction may have on a historical resource (e.g., site, building, object or structures) by analyzing its current condition and documenting any modifications and changes to its original state as well as identifying any potential human or natural threats to its existence.

Capital Improvement: Capital improvement" or "capital project expenditure" means those activities relating to the acquisition, restoration, public access, and recreational uses of such lands, water areas, and related resources deemed necessary to accomplish the purposes of this chapter. Eligible activities include, but are not limited to: the initial removal of invasive plants; the construction, improvement, enlargement or extension of facilities' signs, firelanes, access roads, and trails; or any other activities that serve to restore, conserve, protect, or provide public access, recreational opportunities, or necessary services for land or water areas. Such activities shall be identified prior to the acquisition of a parcel or the approval of a project. The continued expenditures necessary for a capital improvement approved under this subsection shall not be eligible for funding provided in this chapter.

Desired future condition: Desired Future Condition is a description of the land or resource conditions that are believed necessary if management goals and objectives are fully achieved. Desired Future Condition varies by specific habitat and ecosystem. It can also vary, based upon a specific agency's management goals.

Evaluation: Review by a professional in archaeology, history or architecture as to the integrity and significance of the site, building or structure. The criteria of the National Register of Historic Places will be applied.

Facility: all developed structures and improvements provided for a specific purpose or contained within a clearly defined area.

Fire management plan: An element of the land management plan or an independent document that outlines the goals and objectives of a fire management program (prescribed and wildfire) for a predetermined period of time.

Historic: An object, site or structure that is 50 years or older.

Hydrological assessment: A documented, systematic evaluation by a qualified professional of the existing and historical quantity, quality, movement and function of water resources (e.g., computer modeling).

Imperiled species: A species or subspecies that is listed by the U.S. Fish and Wildlife Service as Endangered or Threatened; Florida Fish and Wildlife Conservation Commission (FWC) as Endangered, Threatened, or Special Concern; Florida Department of Agriculture and Consumer Services (FDACS) as Endangered or Threatened; or is tracked by Florida Natural Areas

Inventory (FNAI) as globally or state Critically Imperiled or Imperiled. Imperiled Species does NOT refer to species that are on the FDACS list of commercially exploited plants that are not Endangered or Threatened.

Improve: the enhancement or expansion of facilities, roads and trails.

Maintenance: the daily or regular work of keeping facilities, roads and trails in proper condition.

Monitoring: Periodic examination of the site, building or structure to determine the current condition and threats such as erosion, structural deterioration, vegetation intrusion, poaching or vandalism. An updated Florida Master Site File form is used to complete this assessment.

Natural community/habitat/ecological improvement: Similar to restoration but on a smaller less intense scale. Typically includes small scale vegetation management activities, spot treatments of exotic plants, or minor habitat manipulations. Any habitat alteration that increases the diversity of a habitat or increases the population of a particular species.

Natural community/habitat/ecological restoration: The process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegitation structure, and physical characters. Activities may include vegetative treatments (e.g., hardwood removal, mechanical treatment, pine tree thinning, etc.), groundcover establishment, non-commercial tree plantings, erosion control, hydrological manipulation(filling ditches), and beach management.

Not in maintenance condition: Species composition and/or structure is outside the targeted range. The natural community is in need of more frequent or recurring management treatments that are beyond maintenance activities. Examples include natural communities with exotic plant or animal infestations that are at levels requiring significant treatment, natural communities that have exceeded maximum targeted fire return intervals, and natural communities in need of restoration treatments.

Poor, fair, good condition: Evaluating the condition of cultural resources is accomplished using a three part evaluative scale, expressed as good, fair and poor. These terms describe the present condition, rather than comparing what exists against the ideal. "Good" describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. "Fair" describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A "fair" assessment is cause for concern. "Poor" describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

Population survey: Using broadly accepted methodologies to detect changes in population trends over time.

Public access: access by the general public to state lands and water, including vessel access made possible by boat ramps, docks, and associated support facilities, where compatible with conservation and recreation objectives.

Recorded: A Florida Master Site File form has been completed and filed with the Florida Department of State, Division of Historical Resources.

Recreational/visitor opportunity: measure of potential number of users based on existing resource conditions and developed facilities.

Repair (major): the restoration of facilities, road and trails to proper condition after damage or failure.

Restoration underway: restoration planning/design, executing, evaluating and reporting.

Restored/Maintenance condition: (refers to natural community) - within the range of target species composition and structure such that no significnat, non-recurring alterations to structure or species composition are needed for ecological restoration. Invasive exotic plants or animals are absent or at at levels requiring minimal recurring treatments, and prescribed fire rotations are within target intervals. Refers to Natural Communities. Includes NCs that meet DFC, and NCs that have received restoration action (such as thinning, clearcut and native species planting) and only require time and recurring maintenance actions such as prescribed fire, maintenance level exotics control, or sustainable forestry practices if applicable.

Road: a paved or unpaved motor vehicle route unless identified and managed as a trail.

Significant: Listed in or determined eligible for listing in the National Register of Historic Places as an individual property, element of a multiple listing or in an historic district. Cultural resource professionals are able to make the determination, but final determination rests with the Director of the Division of Historical Resources.

Sustainable forestry: The stewardship and harvest of forest products in a way, and at a rate, that maintains their biodiveristy, productivitiy, regeneration capacity, vitality, and potential to fulfill, now and in the future, relevant ecological, economic, and social functions at local, national and global levels, and that does not cause damage to other ecosystems.

Systematic survey: A sampling protocol designed to assess the occurrence or population status of a species or a suite of species (e.g., presence/absence, mark and recapture, transect survey, etc.).

Trail: a linear route or path which has been specifically prepared or designed for one or more recreational functions such as hiking, biking, horseback riding or multiple use. In many cases, unimproved service roads are also designated as trails.

Treatment: A mechanical, chemical, biological or manual action that changes the structure or composition of an area in order to facilitate restoration or improvement.

Visitor carrying capacity: An estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site.

Wildlife activities: wildlife-associated recreation such as birdwatching, fishing, hunting, etc.

11.11 FNAI Elemental Occurrence Data Usage Letter

FLORIDA Natural Areas INVENTORY

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

November 15, 2021

Dylan Hasse, Senior Conservation Planner
Land Conservation and Planning Subsection
Florida Fish and Wildlife Conservation Commission
Tallahassee, FL

Dear Dylan,

By virtue of this letter, we are updating and continuing our agreement that it is unnecessary for your office to request FNAI Element Occurrence data for each land management plan you prepare, under the following conditions:

- FNAI will continue to provide our Florida Element Occurrence Map Package to FWC on a quarterly basis
- The FNAI GIS data will be available to FWC staff for reference and incorporation as required in management plan review and preparation with the following restrictions.
- FWC will limit spatial reference to Element Occurrence locations in public documents to the Management Area level (i.e., EOs will not be displayed on public maps to protect sensitive resources, habitats, and data sources)
- For Management Areas less than 160 acres in size, FWC will not list occurrences of resources (i.e., species and natural communities) coded as Data Sensitive. If desired, these sensitive resources can be included in a table as a count of occurrences and resource (e.g., three additional occurrences of two species/resources are coded as sensitive)
- When possible, FWC should use the FNAI provided Element Occurrence polygons, and consider the Representational Accuracy and Locational Uncertainty of each record, when determining which species occur on a Management Area

The FNAI Data Manager currently provides this update to FWC staff on a quarterly basis. Current FWC contacts are Rene Baumstark, Christi Santi, Steven Nicholl, Kristal Walsh, Kristen Sella, and yourself. We are pleased to continue this beneficial collaboration with the Florida Fish and Wildlife Conservation Commission.

Sincerely,

Frank Price
Assistant Director
Florida Natural Areas Inventory

Florida Resources and Environmental Analysis Center
Institute of Science and Public Affairs
The Florida State University

Tracking Florida's Biodiversity

11.12 FWC Apiary Policy

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Apiary Policy

Division of Habitat and Species Conservation

Issued by:
Terrestrial Habitat Conservation and Restoration Section
9/1/2010

Enclosed is the HSC/THCR Apiary Policy for all Florida Fish and Wildlife Conservation Commission's Wildlife Management Areas and Wildlife and Environmental Areas.

1

DIVISION OF HABITAT AND SPECIES CONSERVATION POLICY
Issued September 2010

SUBJECT: APIARY SITES ON FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION WILDLIFE MANAGEMENT AREAS AND WILDLIFE AND ENVIRONMENTAL AREAS

STATEMENT OF PURPOSE: It is the intent of this policy to determine which Florida Fish and Wildlife Conservation Commission (FWC) Wildlife Management Areas or Wildlife and Environmental Areas (WMA/WEA) may have apiary sites, and provides direction on site location, management and administration of said apiaries.

Definitions

Apiary – A place where bees and beehives are kept, especially a place where bees are raised for their honey.

Apiary Site – An area set aside on a WMA/WEA for the purpose of allowing a beekeeper to locate beehives in exchange for a fee as established by contract between the beekeeper and FWC.

Apiary Wait List – An apiary wait list will be maintained by the Terrestrial Habitat Conservation and Restoration (THCR) Section Leader's Office based on applications received from interested beekeepers. Only qualified apiarists will be added to the list. To become qualified the new apiarist must submit an application form and meet the criteria below under the section titled "Apiary Wait List and Apiary Application."

Beekeeper/Apiarist – A person who keeps honey bees for the purposes of securing commodities such as honey, beeswax, pollen; pollinating fruits and vegetables; raising queens and bees for sale to other farmers and/or for purposes satisfying natural scientific curiosity.

Best Management Practices – The Florida Department of Agriculture & Consumer Services (FDACS; Division of Plant Industry (DPI), Apiary Inspection Section, P.O. Box 147100, Gainesville, FL 332614-1416) provides Best Management Practices (BMP) for maintaining European Honey Bee colonies and FWC expects apiarists to follow the BMP.

Hive/Colony – Means any Langstroth-type structure with movable frames intended for the housing of a bee colony. A hive typically consists of a high body hive box with cover, honey frames, brood chambers and a bottom board and may have smaller super hive boxes stacked on top for the excess honey storage. A hive/colony includes one queen, bees, combs, honey, pollen and brood and may have additional supers stacked on top of a high body hive box.

Establishment of Apiary Sites on WMA/WEA

During the development of an individual WMA/WEA Management Plan, apiaries will be considered under the multiple-use concept as a possible use to be allowed on the area. "Approved" uses are deemed to be in concert with the purposes for state acquisition, with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals, and objectives as expressed in the agency strategic plan and priorities documents. Items to consider when making this determination can also include:

- Were apiaries present on the area prior to acquisition?
- Are there suitable available sites on the WMA/WEA?
- Will the apiary assist in pollination of an onsite FWC or offsite (adjacent landowner) citrus grove or other agricultural operation?

For those WMA/WEAs that have not considered apiaries in their Management Plan, upon approval of this policy Regional Staff will work with the Conservation Acquisition and Planning (CAP) staff and THCR Section leadership to determine if apiaries are an approved use on the area. If apiaries are considered an approved use then a request will be made to the Division of State Lands to allow this use as part of an amended Management Plan. This request will be made through the THCR's Section Leader's office and coordinated by the CAP.

Determination of apiary site locations on WMA/WEAs should be done using the following guidelines:

- Apiary sites should be situated so as to be at least one-half mile from WMA/WEA property boundary lines, and at least one mile from any other known apiary site. Exceptions to this requirement must be reviewed by the Area Biologist and presented to the THCR Section Leader for approval.

- Site should be relatively level, fairly dry, and not be prone to flooding when bees would normally be present.

- Site should be accessible by roads which allow reasonable transfer of hives to the site by vehicle.

- If a site is to be located near human activity, such as, an agricultural field, food plot, wildlife opening, campsites, etc., or if the site may be manipulated by machinery at a time when bees would be present, then the apiary site should be located at a minimum of 150 to 200 yards from the edge of that activity. This will ensure minimal disturbance to the bees and minimize incidents with anyone working in the area.

- It is preferable to have apiary sites located adjacent to or off roads whenever possible. If traditional apiary sites were located on roads and the Area Biologist determines that the site will not impact use of the road by visitors then it will be allowed.

- FWC Area Biologist shall select apiary site(s) and the site(s) selected should not require excessive vegetation clearing (numerous large trees, dense shrubs) or ground disturbance (including fill).

WMA/WEA Staff Responsibilities

Area Biologist on WMAs/WEAs with approved apiary sites will forward a GIS shapefile depicting all the apiary site polygon(s), including a name or number with coordinates for each apiary site, to the THCR Contract Manager.

Area Biologist will monitor each apiary site no less than once a year to determine if the beekeeper is abiding by the contract requirements. If violations are noted, staff should bring them to the attention of the beekeeper for correction. If violations continue staff should notify the THCR Contract Manager who will determine if or what additional action is warranted.

Area Biologist will establish and maintain firelines around the apiary site to ensure the apiary site is ready when a planned burn is scheduled.

Area Biologist will advise the beekeeper of burn plans, road work, gate closures, or other site conditions and management activities that may affect the beekeeper's ability to manage or access the apiary site.

Area Biologist is not responsible to ensure access roads are in condition suitable for beekeepers to access their hives with anything other than a four wheeled drive vehicle. (The site of the apiary may be high and dry, but the roads accessing them may be difficult to impossible to get a two wheeled drive vehicle into during extreme weather, e.g., heavy rainfall events.)

Apiary Wait List and Apiary Application

An electronic waiting list for apiary sites will be maintained by the THCR's Contract Manager for each WMA/WEA. To be placed on the waiting list an interested beekeeper must submit an apiary application form to the contract manager (See Enclosed Application Form). Each applicant will be considered based on the following criteria:

- Proof of a valid registration with the FDACS/DPI.
- Proof of payment of outstanding special inspection fees for existing sites.
- A validated history of being an apiary manager.
- Three references that can attest to the applicant's beekeeping experience.

If an apiary site is becomes available on a WMA/WEA and there are beekeepers on the waiting list interested in that particular area, those individuals meeting the criteria above will be given preference. If there is more than one beekeeper meeting the criteria with their name on the list then a random drawing will be held by the THCR Contract Manager to determine who will receive the site. Beekeepers on the waiting list will be notified in writing of the random drawing's date/location and will be invited to attend. The individual's name selected during this drawing will be awarded the contract.

Apiary agreements are non-transferable. Each agreement serves as a contract between a specific individual or company and FWC, and the rights and responsibilities covered by an individual agreement cannot be transferred.

Contracts

Apiary contracts are for five (5) years and renewals are contingent upon a satisfactory performance evaluation by Area Biologist and concurrence of the THCR Section Leader. Approval is based on apiarist performance, adherence to rules and regulations and general cooperation. If an Area Biologist decides an apiarist whose contract is expiring is unacceptable he may recommend not approving the new contract. If this transpires then the wait list process using random selection will be used. If there is no apiarist on a current wait list then the apiarists who are in good standing with existing contracts will be notified to see if any want to be put on the wait list for the drawing. If none are interested then the site will be put on hold pending a valid request.

Pricing of Apiary Site(s)

Cost of each apiary site will be $40 annually which will include up to 50 beehives. Additional beehives will be charged at the rate of $40 per 50 beehives.

Pricing examples:

- A beekeeper is leasing 2 apiary sites with up to 100 beehives - the fee per year is $80.
- A beekeeper is leasing 3 apiary sites with up to 200 beehives - the fee per year is $160.

Note: The maximum number of hives/colonies allowed on an apiary site will be at the discretion of the apiarist. However, the apiarist is strongly recommended to follow the BMP as recommended by the FDACS/DPI. In addition to providing the BMP, FDACS/DPI's management has recommended 50 hives per site in pineland communities and no more than 100 hives per site in areas with bountiful resources. However, FWC will not dictate the number of hives on a site unless they create land management issues.

Bear Depredation Control at Apiary Site(s)

Beekeepers are required to consult with the WMA/WEA Area Biologist to see if electric fencing is required for their apiary sites. If the Area Biologist requires electric fencing then the

Beekeeper shall construct and maintain electric fences for each apiary site. Numerous electric fence designs have been used to varying success and FWC as a courtesy provides an electric fence technical information bulletin with each Agreement. This bulletin is attached in order to assist the Beekeeper and/or provide a design that has been proven to be reasonable effective.

SUBJECT MATTER REFERENCES

Apiary Inspection Law - Chapter 586, Florida Statutes (see http://www.leg.state.fl.us/Statutes/), Rule Chapter 5B-54, Florida Administrative Code (see www.flrules.org).

The Board of Trustees of the Internal Improvement Trust Fund – Recommended Apiary Agreement Guidelines For Apiaries & Revisions to an Agreement for Apiary Activities on State Lands on September 23, 1986
S:\HSC\THCR\APIARY.BACKUP.POLICY\dlissupport@dos.state.fl.us_20100903_111446.pdf

Senate Resolution 580, September 21, 2006: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:sr580ats.txt.pdf

Attachments

Sample Apiary Agreement W/Attachments (Map Placeholder & Electric Fence Bulletin)

Sample Apiary Site Application Form W/Mission Statement

Best Management Practices for Maintaining European Honey Bee Colonies

Sample of Random Selection Process Procedure

APPROVED:

_____

Division Director or Designee

DATE: _____

APIARY AGREEMENT

AGREEMENT FOR APIARY ACTIVITIES ON STATE LANDS

THIS AGREEMENT is made by and between the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600, hereinafter known as "the COMMISSION," and (Insert Name and Address of Apiarist Here), telephone number (Insert Phone Number of Apiarist Here), hereinafter known as "the USER."

WITNESSETH

In consideration of the mutual promises to be kept by each and the payments to be made by the USER, the parties agree as follows:

1. TERM: This Agreement will begin (Insert date here) or the date signed by both parties, whichever is later, and will end five (5) years from the date of execution. Issuance of a new five (5) year Agreement is contingent upon satisfactory performance evaluation by the Area Biologist and approval of the THCR Section Leader.

2. The COMMISSION Agrees:

    a. To provide apiary sites on state lands, which will be identified by the COMMISSION staff and located on the property identified in (4)(f) below.

    b. To provide technical assistance for bear-proofing, if required by Area Biologist, of sites made available under this Agreement.

    c. To allow the USER to place a total number of (insert number of hive boxes here) hive boxes on the COMMISSION-managed property at the apiary site(s).

3. The USER Agrees:

    a. To pay (Insert Total Dollars Here) on or before the execution date of this Agreement and each year thereafter on or before anniversary date of the original contract execution date, with check or money order payable to the Florida Fish and Wildlife Conservation Commission. All payments shall be remitted to The Florida Fish and Wildlife Conservation Commission, Finance and Budgeting, Accounting Section, PO Box 6150, Tallahassee, FL 32399-6150, and a copy of the check to The Florida Fish and Wildlife Conservation Commission, Terrestrial Habit Conservation and Restoration Section, Attn: Section Leader, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

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b. To have no more than (Insert Number of Hive boxes here) hive boxes on the property at one time.

c. To comply with the Florida Honey Certification and Honeybee Law, Chapter 586, Florida Statutes, and Rule 5B-54, Florida Administrative Code, and all other applicable federal, state, or local laws, rules or ordinances.

d. To not damage, cut or remove any trees in the course of preparing for or conducting operations under this Agreement.

e. To repair within 30 days of occurrence any damage to roads, trails, fences, bridges, ditches, or other public property caused by USER'S operations under this Agreement based on discretion of the COMMISSION to ensure the WMA/WEA management goals are met. All repairs will be coordinated with the Area Biologist to ensure management goals are met. If USER does not comply within the 30 day requirement, then the COMMISSION may use a third party to perform the repairs and charge the USER accordingly.

f. To report any forest fires observed and to prevent forest fires during the course of operations under this Agreement.

g. To abide by all WMA/WEA rules and regulations in addition to items in this Agreement.

h. To notify the Area Biologist within 24 hours when a bear depredation event occurs.

i. To post their name in an agreed upon location at each site covered by this Agreement or otherwise use an identifying system that is approved by the Area Biologist.

j. To furnish proof of general liability insurance prior to starting apiary activities on state property or within 30 days of execution of this Agreement, whichever is earlier, and proof of annual renewal of the general liability insurance policy prior to or upon expiration date of the policy. The USER shall maintain continuous general liability insurance throughout the term of this Agreement for no less than $300,000 for bodily injury and $100,000 for property damage for each occurrence. Such a policy shall name the COMMISSION as the Certificate Holder. The USER's current certificate of insurance shall contain a provision that the insurance will not be canceled for any reason during the term of this Agreement except after thirty (30) days written notice to the COMMISSION.

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k. To be liable for all damage to persons or property resulting from operations under this Agreement, and to release, acquit, indemnify, save and hold harmless the COMMISSION, its officers, agents, employees and representatives from any and all claims, losses, damages, injuries and liabilities whatsoever, whether for personal injury or otherwise, resulting from, arising out of or in any way connected with activities under this Agreement or activities occurring from any other source not under this Agreement and the USER further agrees to assume all risks of loss and liabilities incidental to any natural or artificial condition occurring on state lands cover by this Agreement.

l. To construct and maintain electric fences, if required by the Area Biologist at the Area Biologist's discretion, to provide protection of apiaries from black bear depredation consistent with the technical information bulletin attached to this agreement, and, if so required, to maintain an open buffer around the fencing of five (5) feet or more. (See Attachment 1)

m. To remove all personal property from the site within thirty (30) days of termination or expiration of this Agreement. The USER understands that after this time, all the USER'S personal property remaining on the WMA/WEA shall be deemed abandoned and become the property of the COMMISSION, which will be utilized or disposed of at the sole discretion of the COMMISSION, and that reasonable storage and/or disposal fees and/or costs may be charged to the USER.

4. The parties mutually agree:

a. This Agreement is not transferable.

b. The USER's failure to submit payment by the due date established herein may result in cancellation of the Agreement by the COMMISSION.

c. The USER's failure to submit proof of general liability insurance or proof of annual renewal in compliance with (3) (j) above may result in cancellation of this Agreement by the COMMISSION.

d. This Agreement shall be in effect for a period of five (5) years and issuance of a new agreement will be contingent upon a satisfactory performance evaluation and approval of the Area Biologist and THCR Section Leader.

e. Each apiary site shall be situated so as to be at least one-half (1/2) mile inward from state property lines and there shall be at least one (1) mile separation between sites. Exceptions to this rule must be reviewed by Area Biologist

presented to and approved by the Terrestrial Habitat Conservation and Restoration Section Leader.

f. The property covered by this Agreement is described as follows: That the property sites (Insert Area Name) Wildlife Management Area are represented by Attachment 2.

g. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal or reply on a contract to provide goods or services to any public entity; may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant with any public entity; and may not transact business with a public entity.

h. As part of the consideration of this Agreement, the parties hereby waive trial by jury in action brought by either party pertaining to any matter whatsoever arising out of or in any way connected with this Agreement. Exclusive venue for all judicial actions pertaining to this Agreement is in Leon County, Florida.

i. This Agreement may be terminated by the COMMISSION upon thirty (30) days written notice to the USER in the event the continuation of the apiary activities are found to be incompatible with the COMMISSION'S management plans or for any other reason at the sole discretion of the COMMISSION.

This Area Intentionally Left Blank

IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year last below written.

_____
USER SIGNATURE

Date: _____

_____
Witness

_____
Witness

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

_____
Mike Brooks, Section Leader
Terrestrial Habitat Conservation and Restoration

Date: _____

Approved as to form and legality

_____
Commission Attorney

Date: _____

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AGREEMENT
ATTACHMENT 1

Use of Electric Fencing to Exclude Bears And Prevent Property Damage

Florida Fish and Wildlife Conservation Commission
Technical Information Bulletin (2001)

Electric fencing has proven effective in deterring bears from entering landfills, apiaries (beehives), livestock pens, gardens, orchards, and other high-value properties. Numerous electrical fence designs have been used with varying degrees of success. Design, quality of construction, and proper maintenance determine the effectiveness of an electric fence. The purpose of this technical bulletin is to assist the property owner in understanding and implementing electrical fencing as a tool to exclude and prevent damage caused by black bears.

Understanding Electric Fencing

Electric fencing provides an electrical shock when an animal comes into contact with the electrically charged wires of the fence. People unfamiliar with electric fencing often are afraid that it will injure, permanently damage, or kill an individual or pet that contacts the fence. **This is not true!** A properly constructed electric fence is safe to people, pets, and bears.

Components of Electric Fencing

An electric fence is composed of four main elements: a charger, fence posts, wire, and the ground rod.

Fence Charger. On a small scale electric fence (like that typically needed for bear exclusion), the largest cost is normally the fence charger. A fence charger's job is to send an electrical pulse into the wire of the fence. Contrary to popular belief, there is not a continuous charge of electricity running through the fence. Instead the charger emits a short pulse or burst of electricity through the fence. The intensity and duration of the electrical pulse varies with the type of charger or controller unit. Chargers with a high-voltage, short duration burst capacity are the best because they are harder to ground out by tall grass and weeds. These types are also the safest, because, even though the voltage is high (5 kilovolts) the duration of the burst is very short (2/10,000 of a second) (FitzGerald, 1984).

Two basic energy sources for chargers are batteries (12-volt automotive type) and household current (110 volt). Battery-type chargers are typically cheaper to purchase but require more maintenance because of the necessity of charging the battery. The advantage of a battery powered charger is that it can be used in a remote location where 110-volt current is not available. Most units that are powered by a fully charged 12-volt deep-cycle batteries can last three weeks before needing a charge. Addition of a solar trickle charger will help prolong the duration of effective charge in 12-volt batteries.

Fence Posts. On small scale fences, the posts are normally the second largest expense involved in construction. Therefore, when planning an electric fence it is a good idea to utilize existing fencing in order to save money. If no existing fence is available, posts will need to be placed around the area needing protection. Posts may be wood, metal, plastic, or fiberglass. Wood and metal posts will need to have plastic insulators attached to them which prevent the electric wire from touching the post causing it to ground out. Plastic and fiberglass posts do not need insulators, the wire may be affixed directly to these posts. Wood and metal posts are typically more expensive and require the added expense of insulators, however, they are more durable and generally require less maintenance.

Wire. Fourteen to seventeen gauge wire is the most common size range used in electric fencing. Heavier wire (a lower gauge number) is more expensive but carries current with less resistance and is more durable (FitzGerald, 1984).

The two most common types of wire are galvanized and aluminum. Galvanized wire is simply a steel wire with a zinc coating to prevent rust, which makes the wire last longer. Some wire is more galvanized than others. The degree or amount of zinc coating that is around the core steel wire is measured in three classes. A class I galvanization means the wire has a thinner coating of zinc than a class II galvanization. Class III galvanized wire has the heaviest zinc coating and will last longer than the class I and class II wire (FitzGerald, 1984). In general, the cost of galvanized wire increases as the class or amount of galvanization increases.

Aluminum wire is typically more expensive than the galvanized wire. Some advantages of aluminum wire are: it will not rust, it conducts electricity four times better, and it weighs one-third less than steel wire.

The Ground Rod. The ground is an often overlooked, but critical part of an electric fence. Without a good ground, electricity will not flow through the wire. When an animal touches a charged wire, the body of the animal completes the electrical circuit and the animal feels the "shock". The current must travel from the charger through the wire to the animal and then back through the ground to the charger if the animal is to feel the shock. The soil acts as the return "wire" (ground) in the circuit. However, if a

bird was to land on a charged wire without touching the soil the bird would not complete the circuit and would be unaffected (FitzGerald, 1984). Some fence configurations use actual grounded wires within the fence to enhance the grounding system.
The ground may be a commercial ground rod or a copper tube or pipe driven six to eight feet in moist soil. Copper is expensive, so a copper coated steel pipe or any other good conducting metal pipe will work also. Very dry soil can effect the ability to create a good ground and has sometimes been a problem during drought conditions. Pipe may be a better choice than a solid rod during drought conditions, because water may be poured down the ground pipe to improve the ground. Some fence configurations use wires as the grounding system, rather than relying solely on the soil as a ground.

Recommended Electric Fence to Deter Black Bears

Conditions at fence sites will vary and will determine what the most effective fence configuration will be. Commission biologists welcome the opportunity to visit sites and provide custom tailored advice on constructing an effective electric fence. The following recommendation will cover most situations with low to moderate pressure from black bears. Use a five strand aluminum wire fence that is 40 inches high with wire spacing every eight inches apart using the previously mentioned wired grounding system (see Figure 1). The wire closest to the ground level (the lowest wire) should be a charged or "hot" wire. The second wire should be grounded. The third wire should be hot. The fourth wire should be grounded and the fifth wire should be hot. If using metal or wood posts, insulators must be used to keep the hot wires from grounding out. The cost of this type of electric fence utilizing fiberglass posts and a 110 volt fence charger is approximately $200 for a 40' x 40' area (160 linear feet of fence).

Materials:
1 - 1, 312 foot roll (1/4 mile) 14 gauge aluminum electric fence wire
1 - 50 foot roll 12 gauge insulated wire
20 - 5 foot 5/8 inch dia fiberglass fence posts
5 - plastic gate handles
1 - 110 volt fence charger
1 - 10 foot ground pipe
4 - plastic electric fence signs

Installation. These instructions are for a square shape fence exclusion, but the process would be very similar for other applications. Drive 4 corner posts 1-foot deep into ground and stake with guy wires. Clip, rake, and keep clear any vegetation in a 15-inch wide strip under the fence and apply herbicide. Attach and stretch the aluminum wire at 8-inch increments starting 8 inches from ground level. A loop of wire should be left on each wire at the first corner post. Once the wire has been stretched around the outside of all the corner posts back to the first post a plastic gate handle should be attached to each wire and the gate handles should be attached to each

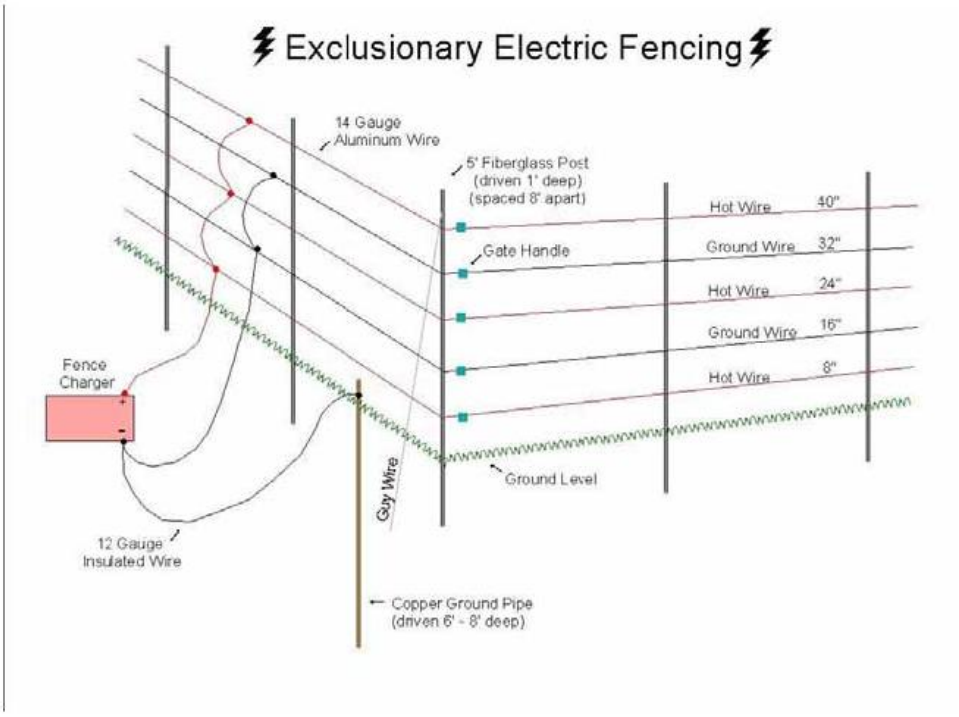
corresponding loop on the first corner post. Drive in the remaining 16 posts to the same depth at 8-foot intervals between corner posts. Secure each of the five wires to each of the posts with additional wire. Attach four plastic electric fence signs (one on each side) to the top wire of the fence. Attach a 12-gauge strand of insulated wire to the positive terminal of the fence charger and attach it to the first, third, and fifth wires of the fence. Attach another 12 gauge insulated wire to the negative terminal of the charger and attach this wire to the ground pipe which has been driven into the ground 6 to 8-feet deep. Attach another 12 gauge insulated wire from the negative terminal of the charger to the second and fourth wires on the fence. Plug the charger into a 110 volt power supply and the fence is in operation.

Tips to improve the effectiveness of your electric fence to deter black bears:

1. If using a 12-volt fence charger, ensure that the battery is charged; check every two weeks.
2. Make sure terminals on the charger and battery are free of corrosion.
3. Make sure hot wires are not being grounded out by tall weeds, fallen tree branches, broken insulators, etc.
4. If fence wires have been broken and repaired, make sure wires are corrosion free where they have been spliced together. Also, tighten the fence at each corner post as wires that have been spliced and are loose make poor connections.
5. Be sure to rake vegetation from under and around the outside of the fence as this may act as an insulator.
6. To improve the ground around the perimeter of the fence add a piece of 24 inch chicken wire laying on the ground around the outside of the fence. This should be connected to ground.
7. During periods of drought pour water down the ground pipe and around the ground pipe to improve the ground. Digging a 6 inch deep 6 inch diameter hole around the ground pipe and back filling with rock salt will also improve the ground. Additional ground pipes may also be added to portions of the fence farthest from the charger.
8. To ensure that the bear solidly contacts the charged portion of the fence, a bait like bacon strips, a can of sardines, or tin foil with peanut butter may be attached to one of the top hot wires. Make sure these do not contact the ground, thus shorting out the fence.
9. When protecting a specific structure (like a shed or rabbit hutch), the fence should be placed 3 to 5 feet away from the structure (rather than on it) so that the bear encounters the fence before reaching the attractant.
10. Protect the fence charger from the elements by covering it with a plastic bucket or a wooden box.
11. Place plastic electric fence signs around the perimeter of your fence to improve visibility and to warn other people.

LITERATURE CITED

FitzGerald, James (1984), *The Best Fences*. Storey Publishing Bulletin A-92, Pownal, Vermont. p. 14-16.



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AGREEMENT
ATTACHMENT 2

Place Holder for Map

Of

Apiary Locations

At

WMA/WEA

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APIARY SITE APPLICATION FORM

Florida Fish and Wildlife
Conservation Commission

RETURN TO: The Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600. Please print or type all information. Attach additional sheets if necessary.

Name _____ Telephone Number _____

Mailing Address _____

City or Town_____ County _____ Zip Code _____

Physical Address (If Different from Mailing Address) _____

Company Name: _____

Email Address _____

Requested Wildlife Management or Wildlife and Environmental Area(s)(see attached list of WMA/WEAs with apiary sites):

WMA/WEA _____ County_____ # of Sites_____

WMA/WEA _____ County_____ # of Sites_____

WMA /WEA_____ County_____ # of Sites_____

WMA /WEA_____ County_____ # of Sites_____

Planned Number of Hives Per Site: _____ Permanent: ____ Seasonal: _____

Member of Beekeepers Association: Yes____ No____

Number of Years a Member_____

Name of Beekeepers Association:_____

Are you registered with Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI):_____Yes _____No _____N/A If yes, please provide proof.

Are you current with any and all special inspection fees:_____Yes _____No _____N/A. If yes, please provide proof.

Do you follow all recommended Best Management Practices from FDACS/DPI?:_____Yes _____No

If no, then please explain on a separate piece of paper.

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Please provide below a chronological history of your beekeeping experience. If you need more space, please provide additional sheets:

References: If a new apiary contractor, please provide on a separate piece of paper at least 3 references who can verify your apiary experience. Provide each reference's name, address, phone number and email address (if applicable). Please attach reference sheet to this document and submit.

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MISSION STATEMENT

Management

Of

Florida Fish and Wildlife Conservation Commission's

Wildlife Management Areas

And

Wildlife and Environmental Areas

The mission of the Florida Fish and Wildlife Conservation Commission (FWC) is to manage fish and wildlife resources for their long-term well-being and the benefit of the people. To aid in accomplishing this mission, one of FWC's management goals is to manage fire-adapted natural communities on our Wildlife Management and Environmental Areas (WMA/WEA) to support healthy populations of the plants and animal's characteristic of each natural community. In order to achieve this goal various habitat management techniques are used. These include prescribed burning, applications of herbicides and mechanical treatment of vegetation. These management efforts will take place at various times and locations on each of the FWC's WMA/WEAs. Staff on each WMA/WEA will work with and make users aware of these activities when necessary. Users must be aware and accept that these activities are necessary for the proper management of the area.

Note: This document is included as an attachment with each Application and executed Contract.

FDACS/DPI's BMP

Florida Department of Agriculture & Consumer Services

BEST MANAGEMENT PRACTICES FOR

MAINTAINING EUROPEAN HONEY BEE COLONIES

1. Beekeepers will maintain a valid registration with the Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI), and be current with any and all special inspection fees.

2. A Florida apiary may be deemed as European Honey Bee with a minimum 10% random survey of colonies using the FABIS (Fast African Bee Identification System) and/or the computer-assisted morphometric procedure (i.e., Universal system for the detection of Africanized Honey Bees (AHB) (USDA-ID) or other approved methods by FDACS on a yearly basis or as requested.

3. Honey bee colony divisions or splits should be queened with production queens or queen cells from EHB breeder queens following Florida's Best Management Practices.

4. Florida beekeepers are discouraged from collecting swarms that cannot be immediately re-queened from EHB queen producers.

5. Florida Beekeepers should practice good swarm-prevention techniques to prevent an abundance of virgin queens and their ready mating with available AHB drones that carry the defensive trait.

6. Maintain all EHB colonies in a strong, healthy, populous condition to discourage usurpation (take over) swarms of AHB.

7. Do not allow any weak or empty colonies to exist in an Apiary, as they may be attractive to AHB swarms.

8. Recommend re-queening with European stock every six months unless using marked or clipped queens and having in possession a bill of sale from an EHB Queen Producer.

9. Immediately re-queen with a European Queen if previously installed clipped or marked queen is found missing.

10. Maintain one European drone source colony (250 square inches of drone comb) for every 10 colonies in order to reduce supercedure queens mating with AHB drones.

11. To protect public safety and reduce beekeeping liability, do not site apiaries in proximity of tethered or confined animals, students, the elderly, general public, drivers on public roadways, or visitors where this may have a higher likelihood of occurring.

12. Treat all honey bees with respect.

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RANDOM

SELECTION PROCESS

FOR VACANT APIARY SITE

When an apiary site becomes available the following procedure is used to randomly select the next apiarist (beekeeper) for an available apiary site on a WMA or WEA. Only those who have been evaluated and deemed qualified to be an apiarist on a WMA/WEA through the Apiary Application process will be eligible for this selection process. The steps below will be followed by the THCR Contract Manager when a site becomes available to be filled by a qualified apiarist:

1. The THCR Contract Manager will maintain an "Apiary Wait List Folder" on the THCR SharePoint for each WMA/WEA with apiary sites.
2. A wait list is either created or updated when an Apiary Application(s) is received by the THCR Contract Manager from a qualified apiarist.
3. Upon receipt of an apiary site application, the THCR Contract Manager will review the WMA/WEA folder to see if there is an "Apiary Wait List".
4. If a list exists then the qualified applicant will be added to the list.
5. When an apiary site becomes available if there are more than one qualified apiarist then these apiarists will be contacted by certified letter to determine their interest.
6. The letter will request a response within 10 working days to make them eligible for the random drawing.
7. If there is no response or is negative then that apiarist will not be included in the random drawing and the name will be removed from the waiting list*.
8. If only one apiarist responds positively to the certified letter then the available site will be awarded to that interested apiarist.
9. If there are no apiarists on a wait list or all responses are negative then apiarists who currently have site(s) under Agreement and where not on the waiting list will be contacted to see if any have interest in the available site. If more than one responds then the random drawing process will be used to determine who will be awarded the site.

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10. Steps to be performed by the THCR Contract Manager to execute the random selection for an available apiary site are listed below:

    a. The names of each interested apiarist will be noted on a 1" X 2" piece of paper and folded in half.

    b. The pieces of paper will be inserted into a "black film canister" which has a snap top and placed into a container and stirred up prior to the selection.

    c. A non-biased person will be selected to reach into the bowl (which will be held above the selection person's eyesight) and randomly select one of the canisters.

    d. The canister will be opened by the person performing the selection and the name is read aloud for those in attendance. Everyone in attendance will sign a witness sheet.

    e. The apiarist whose name is selected will be awarded the available site.

    f. A new Agreement will be developed by the THCR Contract Manager.

*A new apiary application must be submitted once requestor's name is removed from a waiting list.

11.13 Prescribed Burn Plan

Suwannee Ridge Wildlife and Environmental Area

Prescribed Burning Plan

August 2025

INTRODUCTION

Fire in general has been an important part in the composition of Florida's ecosystem for eons. Many indigenous humans utilizing fire as a tool along with historical lightning strikes and minimal fire suppression, developed and maintained fire-dependent plant communities in the southeastern United States. Exclusion of fire leads to growth of dense brush and eventual succession into a climax hardwood community. This change results in undesirable conditions for species that rely on fire (Gilliam and Platt 1999).

The suppression of today's lightning-sparked wildfires is intended for the safety of the public and not the integrity of Florida's ecosystem. In order to maintain the overall effects of fire within fire-dependent communities, prescribed fires are conducted. Intentionally started under favorable conditions, these fires mimic "natural" fires but are strategically planned and implemented.

Resource managers in Florida rely on prescribed burning as an important land management tool. Prescribed burning is used for habitat improvement and manipulation, fuel reduction, disease and insect control, and site preparation. It is a recommended tool for management of such game animals as white-tailed deer (*Odocoileus virginianus*), Northern bobwhite (*Colinus virginianus*), mourning dove (*Zenadia macroura*), and wild turkey (*Meleagris gallopavo*) (U.S. Forest Service 1969, Stoddard 1971). The value of prescribed fire to these and other animals, such as raptors and some songbirds, is well documented (Engstrom and Brownlie 2002). Prescribed fire benefits wildlife by reducing underbrush density, thus improving access, promoting the growth of succulent vegetation, and lowering browse to feeding height of deer. Aesthetic values are also enhanced by the growth and fruiting of important wildlife food plants, such as dewberries (*Rubus spp*.) and blueberries (*Vaccinium spp*.) (Smith 2000).

BURN OBJECTIVES

Prescribed fire will be used on Suwannee Ridge Wildlife and Environmental Area (SRWEA) as a habitat management tool exclusively or in conjunction with other management techniques to accomplish a variety of objectives. The primary objective for using prescribed fire on SRWEA is to restore and/or maintain fire-dependent natural communities. This will result in preserving native plant communities including restoration of native groundcover while simultaneously improving

wildlife habitat. The benefits derived from prescribed burning on SRWEA include not only long-term preservation of native plant communities and improved wildlife habitat but numerous others as well:

1) Reduction of fuel loads, which will help to prevent or mitigate effects of wildfires.
2) Enhancement of the area aesthetics by controlling undesirable vegetation.
3) Control of exotic plant species.
4) Improved public access.

DESCRIPTION OF AREA

SRWEA occupies 1,428 acres in southern Hamilton County, between Live Oak and Jasper, Florida. The confluence of the Alapaha and Suwannee rivers is located 2.5 miles southeast of the tract. Holton Creek Wildlife Management Area, managed by the Suwannee River Water Management District, forms the southern boundary. The SRWEA is composed mostly of upland natural communities, predominately sandhill. Less than three percent of the area is comprised of wetlands. Most of the surrounding private lands consist of improved pasture and commercial pine plantations.

SRWEA is located in Sections 29, 30, 31 and 32, Township 1 North, Range 13 East, and Section 25, Township 1 North, Range 12 East.

SRWEA contains 1,297 acres of fire-maintained natural communities including sandhill, upland pine, upland mixed woodland, depression marsh, and wet flatwoods. Three-quarters of the site consists of sandhill, while the remaining acreage includes dome swamp, sinkholes, and hardwood forests. Dominant canopy species of the upland communities include longleaf pine (*Pinus palustris*), live oak (*Quercus virginiana*), and laurel oak (*Q. hemisphaerica*) with scattered slash pine (*P. elliotii*) and pignut hickory (*Carya glabra*). Mid-story tree species includes turkey-oak (*Q. laevis*), sand post oak (*Q. margaretta),* chinquapin (*Catanea pumila*), and flowering dogwood (*Cornus florida*). Longleaf pine has been planted in sections of clearcut sand pine (*P. clausa)* as well as underplanted in slash pine plantation thinned to < 30 basal area. Live oak, red maple (*Acer rubrum)* and bald cypress (*Taxodium distichum)* dominate canopied wetland communities. Remnant herbaceous groundcover has been observed following restoration efforts, including wiregrass (*Aristida stricta*), pineywoods dropseed (*Sporobolus junceus*), and lopsided indiangrass (*Sorghastrum secundum*) with other grasses and herbs including blazing star (*Liatris spp.)*, broomsedge (*Andropogon spp.),* and a variety of forbs with many species of legumes and asters. Shrubs can be sparse to dense, depending on fire history, and typically include saw palmetto (*Serenoa repens*), sweetgum (*Liquidambar styraciflua),* wax myrtle (*Myrica cerifera)*, red bay (*Persea borbonia*), gallberry (*Ilex glabra*) and sparkleberry (*Vaaccinium arboretum*).

PRESCRIBED BURNING PROGRAM

A. Firelines

Existing features (e.g. roads) are utilized as firelines to safely contain prescribed fires whenever feasible. These roads are evenly spaced throughout the property and delineate 9 management units of modest and manageable size. Many of the roads that are utilized as firelines require either disking or tilling to maintain functional mineral firelines before burning. Firelines will be maintained as roads by FWC personnel and maintained by mowing during non-burning intervals. Approximately nine miles of the perimeter property boundary was constructed forty feet wide to give prescribed fire equipment and personnel room to safely operate as well as a wide space to contain prescribed burning operations within the WEA boundary.

B. Size and Arrangement of Management Units

SRWEA is divided into 9 management units for prescribed fire purposes. Some management units are irregular in shape because the existing road & trail network follows the meandering margins of sinkholes or other wetland features. Management units average 150 acres in size, with the largest management unit at 236 acres and the smallest at 93 acres (Figure 1).

The preferred prescribed burn interval on SRWEA is approximately 1-3 years with a two-year interval being optimal for sandhill and upland pine. Multiple management units can be burned simultaneously to maintain fire-return intervals but are preferably burned individually across time to provide a patchwork or mosaic of diverse habitat, thus increasing habitat diversity and escape cover for desired wildlife.

C. Type of Burn

Burns on SRWEA will begin with a test fire to assess the fire behavior. Then a backing fire will be used on the downwind side of the management unit to establish a blackline. The remainder of the unit will be burned using appropriate fire techniques relative to burn objectives, weather conditions, fuel loads, and fire intensity. Spot, flank, and strip head fires are the most common ignition patterns that will be used dependent on fuel loads. Aerial ignition is another ignition method that allows large acreage to be burned in a short amount of time. Aerial Ignition with a drone has recently (7/15/2025) been used on SRWEA successfully and will be used in the future.

D. Season and Time of Day

Growing season burning will be preferred but dormant season burns will be conducted as needed to maintain fire frequency on management units that miss a growing season rotation or to provide seasonal diversity to mimic natural fire regimes.

Dormant season burns dominate recent burn history on SRWEA to reduce fuel loading and minimize stress on resident pine species as the area is thinned and restored. Growing season burns will occur more frequently as management units experience multiple rotations of prescribed fire. Burning will be conducted primarily during daylight hours; night burning will be avoided due to problems associated with smoke dispersal. However, if favorable conditions exist and permits can be obtained, burning will continue into the night, if necessary.

E. Optimal Weather Conditions

Prescribed burns are ideally conducted 2-5 days following a rain event and require a relative humidity of 30-60% and air temperature of 60-95^{o}F. Winds from any direction can be used as long as wind speeds are not excessive (4-10 mph in the stand). Prescribed burns can occur outside of generally accepted weather parameters depending on local conditions, other contrasting weather parameters, and crew experience. Fine fuel moisture, Keech-Byram Drought Index and the FFS fire danger index are some additional weather parameters that should be considered for the day of the burn.

F. Fire Weather Monitoring

One person will be assigned to monitor fire weather on each burn. This person will monitor and record wind speed, wind direction, temperature, and humidity at a regular interval, or as requested by any burn crew member, during the burn. If conditions stray outside of the burn prescription, appropriate actions will be taken to modify fire strategy until a return to prescription can be achieved. If conditions are not expected to return within prescription, efforts will be made to shut down the burn.

G. Smoke Management

There is considerable flexibility when burning at SRWEA due to the absence of smoke sensitive areas in the immediate vicinity. County Road 249 is adjacent to the northern boundary of SRWEA and requires additional precautions including smoke traffic signs and wind direction, dispersion, and smoke column monitoring. To minimize smoke problems, burning should be conducted when atmospheric conditions are slightly unstable, with a minimum mixing height of 1,600 feet and transport wind speeds of greater than 9 mph (Southern Forest Fire Laboratory 1976, Crow and Shilling 1983). Additionally, the use of backfires, as prescribed, will produce less smoke and consume fuel more completely than a head fire. Residual smoke problems (such as stumps, snags, or logs near state or county roads) will be promptly mopped up and monitored to minimize smoke hazards.

Smoke management can be difficult when night burning because smoke often stays close to the ground making it more difficult to predict actual smoke direction. Smoke tends to travel to lower elevations such as creeks and rivers. Night burning will be approached with caution and in close association with the Florida Forest Service (FFS) to avoid these problems.

Additional parameters regarding smoke management, such as air quality index, may be incorporated into burn planning in the future as dictated by FFS and FWC standards.

H. Personnel

Under ideal conditions and depending on the composition and structure of the management units, burning can be conducted with a minimum crew of five; however, a crew of six to eight is optimal. Depending on unit size and orientation, multiple units can be burned on the same day and the minimum number of crew members needed will be adjusted accordingly. Burn crew members will be assigned tasks according to their training, equipment, and burn experience. Certified and experienced volunteers and personnel from other state and federal agencies (FFS, Department of Environmental Protection, The Nature Conservancy) will be used if needed. All participants will meet the Division of Habitat and Species Conservation (HSC) Prescribed Burning and Wildfire Suppression Standards for their role on a burn. Commission personnel who meet HSC Prescribed Burning and Wildfire Suppression Standards will serve as burn manager conducting a burn.

I. Equipment

All members of the fire crew will wear PPE required by the Division of Habitat and Species Conservation's Prescribed Burning and Wildfire Suppression Standards. Fire flaps, fire rakes, drip torches, a Type VI engine, a tractor-plow, a dozer, a farm tractor, ATVs, UTVs, and slip-in water units will be available. Required equipment specific to each management unit will be dependent on fire return interval, complexity, size, and locality of the prescribed burn. Smoke caution signs for nearby roads will be deployed as necessary.

J. Permits and Notifications

An authorization will be obtained from FFS on the morning of the burn. Various contacts in the regional FWC office and law enforcement dispatch will be notified of each prescribed burn occurring on SRWEA. Other notifications will be made as needed to Florida Highway Patrol, Florida Department of Transportation, Hamilton County Emergency Management, and adjacent landowners.

K. Mop-Up and Monitoring

After the initial ignition/suppression phase has been completed, the standard mop-up standards will be as follows: (1) extinguish all visible flame within 30 feet of perimeter firelines and access roads; (2) ensure that any smoldering fuel must be within the black; (3) burn out or isolate unburned fuels within the unit to prevent spreading fire from occurring two hours after sunset; (4) inspect aerial fuels and snags on perimeter firelines, felling snags away from the line as necessary; and (5) re-inspect and mop-up all firelines as necessary to ensure containment. The day after and subsequent days, management unit will be monitored by assigned personnel, prioritizing the peak fire activity period in the afternoon, until the fire is declared out. Monitoring will be conducted along both sides of perimeter firelines to ensure any visible flame is more than 30' inside the unit and no spot overs occurred. Any location of visible, active flame greater than 30' within the unit will be recorded and re-inspected over subsequent days. Any visible flame within the 30' perimeter will be extinguished until no longer smoking. Unburned fuels along the perimeter and grassy areas within the fireline will be checked to ensure creeping has not occurred or pose a risk to escape.

Mop-up and monitoring standards may change depending on the management unit, updates to agency requirements, burn boss discretion or other factors.

L. Evaluation of Burn

Initial evaluation of the fire will be conducted within one week and include: percent crown scorch, bark char (height), fuel consumption, flame height, fire behavior, smoke dispersion, any escape, adverse publicity, objectives reached, as well as any unusual observation. A follow-up evaluation will be completed within one month and will include crown scorch, understory kill, adverse insect activity and unusual observations. These observations will be incorporated into future burn prescriptions.

SPECIAL CONSIDERATIONS

Wildland fire is an ecologically disruptive event in the immediate short term. However, the long-term benefits of properly timed and applied prescribed fire greatly exceed any short-term disruptions. Care will be taken to protect environmentally sensitive areas and to employ the best fire management actions that will provide the greatest long-term benefit to the largest number of species. Smoke screening will direct special attention to certain areas to ensure prescribed burns do not adversely affect adjacent landowners, nearby roads, schools, hospitals, and airports. Fire size and intensity will be manipulated to minimize fast moving headfires during optimal burning conditions.

Summer prescribed burning is generally performed for hardwood brush control and increased herbaceous vegetation growth. High air temperature reduces the amount of heat needed to raise plant temperatures to lethal levels. Actively growing plants are more easily killed by fire than dormant plants, which results in better hardwood brush control than winter fires (Smith 2000). Growing season burns also promote an increase in herbaceous vegetation growth and species diversity, release planted longleaf pine seedlings from vegetative competition and help to control brown-spot disease, and mimic naturally occurring summer lightning fires.

Sensitive wildlife resources, such as bald eagles (*Haliaeetus leucocephalus*) and gopher tortoises (*Gopherus polyphemus*) will be given special consideration. Bald eagle nests will be excluded from winter burning if possible. Management units with active nest trees will only be burned during the nesting season according to USFWS guidelines and FWC Bald Eagle Minimization Guidelines if no other option exists. Extra precautions will be used to prevent the nest tree from fire induced mortality. Gopher tortoises seem somewhat dependent on vegetation response to fire, and research has shown no adverse effects on this species from prescribed burning (Means and Campbell 1981). Fire size and intensity will be manipulated to minimize impact on individual gopher tortoises. Prescribed burning will produce more of a desirable habitat, thus having a positive effect on the population of gopher tortoises as a whole.

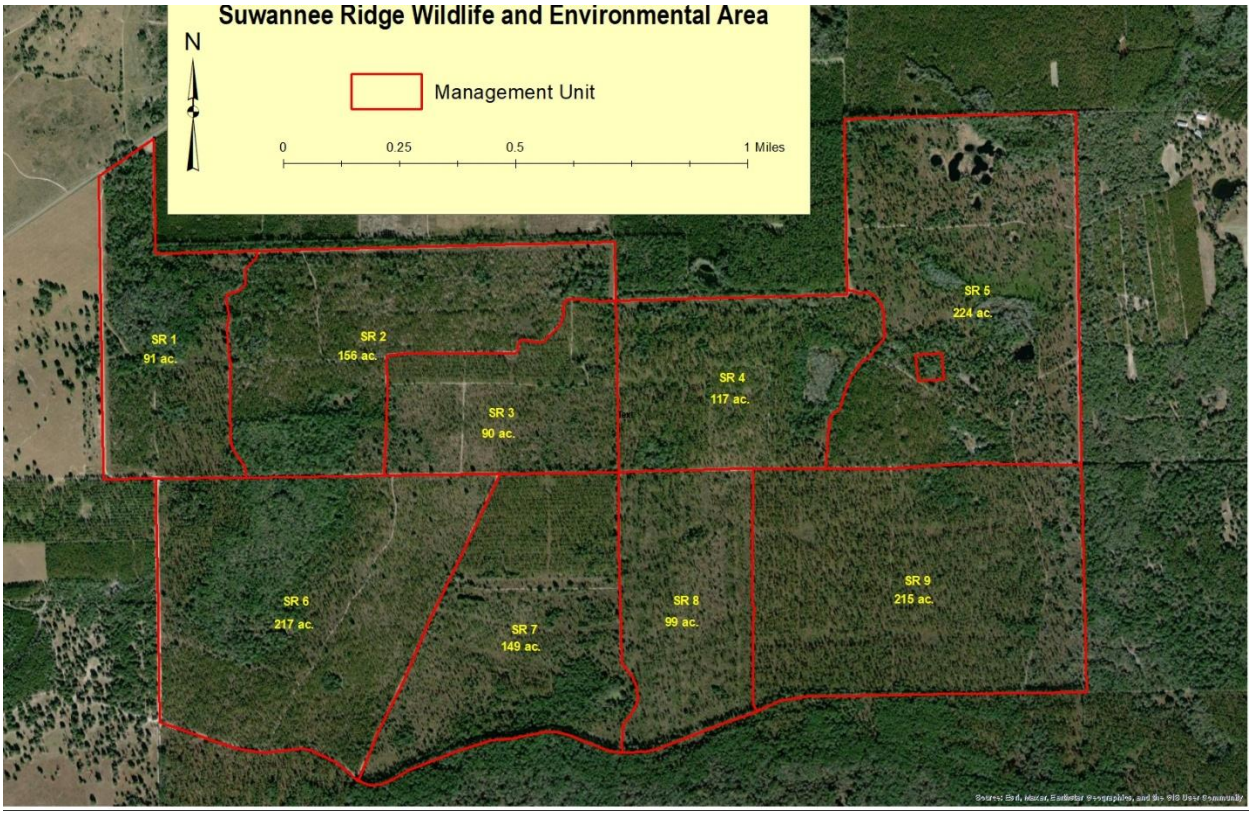


Figure 1. Prescribed burn management units on the Suwannee Ridge Wildlife and Environmental Area.

LITERATURE CITED

Crow, A. B., and C. L. Shilling. 1983. Prescribed burning in Louisiana pinelands. Louisiana State Univ. Coop. Ext. Serv. Pub. 1618.

Engstrom, R. T. and D. J. Brownlie. 2002. Burning for birds: concepts and applications. In: Ford, W. Mark; Russell, Kevin R.; Moorman, Christopher E., eds. Proceedings: the role of fire for nongame wildlife management and community restoration: traditional uses and new directions. Gen. Tech. Rep. NE-288. Newtown Square, PA: U.S. Dept. of Agriculture, Forest Service, Northeastern Research Station: 58-64.

Gilliam, F. S and W. J. Platt. 1999. Effects of long-term fire exclusion on tree species composition and stand structure in an old-growth Pinus palustris (longleaf pine) forest. Plant Ecology. 140: 15-26.

Means, D. B. and H. W. Campbell. 1981. Effects of prescribed burning on amphibians and reptiles. Pages 89-97 in G. W. Wood (ed.). Prescribed fire and wildlife in southern forests. Belle W. Baruch Forest Science Institute, Clemson Univ., Georgetown, S.C.

Southern Forest Fire Laboratory. 1976. Southern forestry smoke management guide book. U.S. For. Serv. Gen. Tech. Rep. SE-10.

Smith, J. K. 2000. Wildland fire in ecosystems: effects of fire on fauna. Ogden, UT: U.S. Department of Agriculture Forest Service, Rocky Mountain Research Station.83 p.

Stoddard, H. L. 1971. Wildlife habitat management handbook--southern region. FSH 2609.23R, U. S. For. Serv., Atlanta, Ga.

U. S. Forest Service. 1969. Wildlife Habitat Improvement Handbook. FSH 2609.11, U.S. For. Serv., Washington, D.C.

11.14 Wildlife Conservation Prioritization and Recovery Program (WCPR) Strategy

Suwannee Ridge Wildlife and Environmental Area Wildlife Management Strategy

May 2021

Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Wildlife and Habitat Management Section

Executive Summary

The Florida Fish and Wildlife Conservation Commission's (FWC) Wildlife and Habitat Management Section (WHM) takes a proactive, science-informed approach to wildlife management on lands in the Wildlife Management Area (WMA) and the Wildlife and Environmental Area (WEA) system. This approach uses information from statewide models, in conjunction with input from species experts and local staff, to create a Wildlife Management Strategy for the area. The FWC intends for this Strategy to provide land managers with information on management and monitoring actions that should be taken to promote the presence and facilitate the persistence of wildlife species on the area.

This document presents the results of a science-informed process for evaluating the needs of locally important species on Suwannee Ridge Wildlife and Environmental Area (SRWEA). The basis of FWC's management is an understanding of natural communities of plants and animals. By restoring and maintaining natural communities, management will benefit the greatest suite of native species reliant upon those natural communities. Monitoring select species verifies whether natural community management is having the desired effect on wildlife. To maximize the potential wildlife conservation benefit, staff considers the role of SRWEA in regional and statewide conservation initiatives throughout the process.

Section 1 introduces the reader to the Strategy.

Section 2 describes historic and ongoing habitat management and monitoring actions on the property.

Section 3 provides an assessment of the area's role in the conservation of locally important species. This section includes management and monitoring recommendations identified during the Wildlife Conservation, Prioritization and Recovery Program (WCPR) workshop.

Section 4 identifies coordination and "beyond the boundaries" opportunities that will assist in conserving these species.

Continuation of resources at current levels are required to provide for most of the land management recommended in this document. Some of the monitoring recommendations may require additional resources, while FWC can accomplish others with continuation of existing resources.

Acknowledgements

The WCPR Strategy development process is intended to be a collaborative effort between multiple Divisions and Sections within the agency, and coordination with experts beyond the FWC. Without the support of these experts, we would not have successfully prioritized our management, monitoring, and coordination efforts for areas like the SRWEA. As such, we would like to highlight the agency, local, and statewide experts that helped shape the discussion on SRWEA, including Adrienne (Doyle) Fitzwilliam, Amy Clifton, Blair Hayman, Brad O'Hanlon, Dan Hipes, David Steen, Elina Garrison, Eric Seckinger, Lisa Smith, Megan Wallrichs, Mike Gillikin and many others. Thank you for taking the time and effort to consider our management lands within context of the conservation needs for the region, as well as the State of Florida.

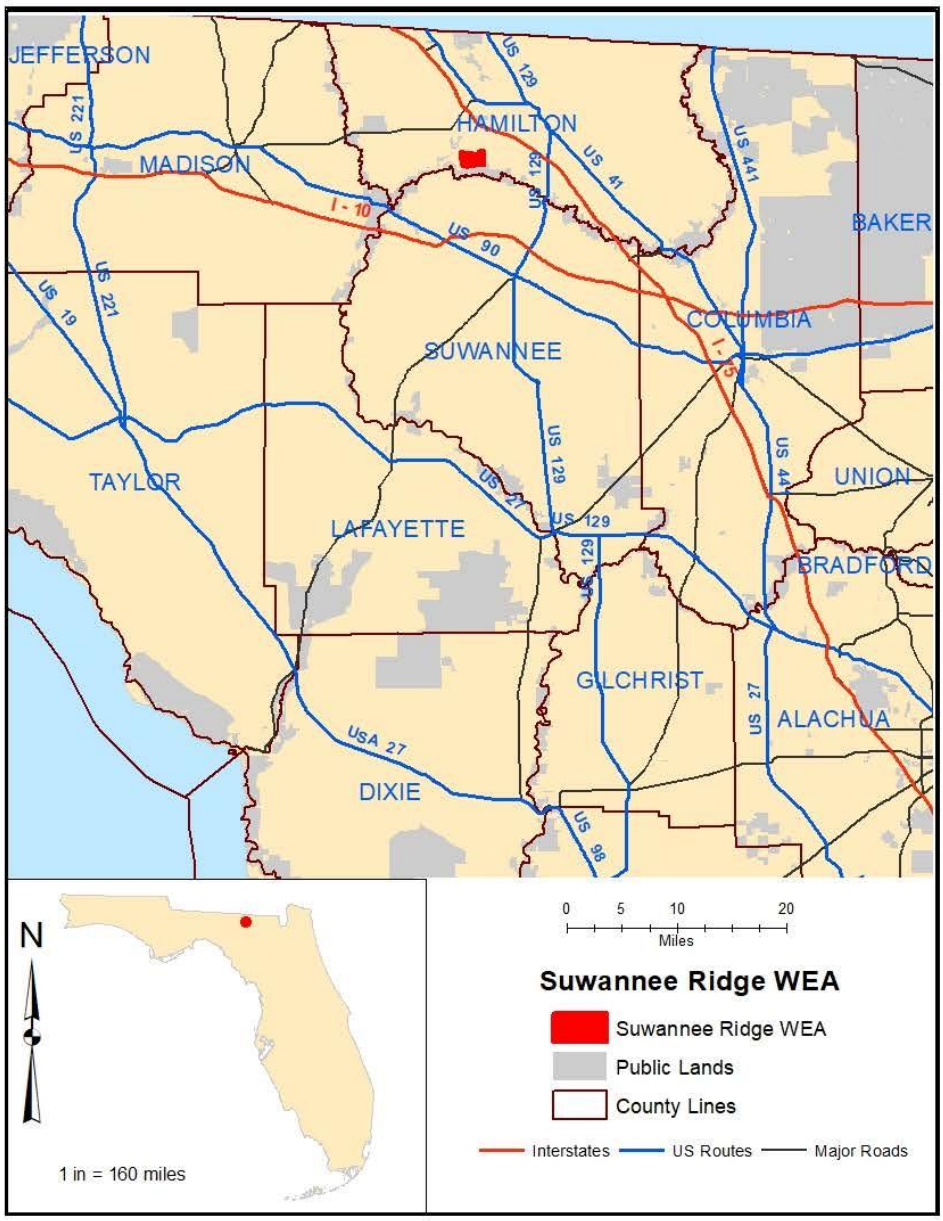
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Acronym List

BA	Basal Area
BSR	Biological Status Review
DFC	Desired Future Condition
FNAI	Florida Natural Areas Inventory
F.S.	Florida Statutes
FWC	Florida Fish & Wildlife Conservation Commission
HCCA	Holton Creek Conservation Area
ISMP	Imperiled Species Management Plan
LTDS	Line Transect Distance Sampling
OBVM	Objective Based Vegetation Management
SAP	Species Action Plan
SRWEA	Suwannee Ridge Wildlife and Environmental Area
SRWMD	Suwannee River Water Management District
WCPR	Wildlife Conservation, Prioritization and Recovery (Program)
WHM	Wildlife & Habitat Management (Section)
WEA	Wildlife and Environmental Area
WMA	Wildlife Management Area

Locator Map


JEFFERSON
MADISON
HAMILTON
BAKER
COLUMBIA
SUWANNEE
TAYLOR
LAFAYETTE
UNION
BRADFORD
GILCHRIST
ALACHUA
DIXIE
US 221
US 129
US 41
US 441
I - 10
US 90
US 19
I - 75
US 27
USA 27
US 98
N
1 in = 160 miles
0 5 10 20
Miles
Suwannee Ridge WEA
Suwannee Ridge WEA
Public Lands
County Lines
Interstates
US Routes
Major Roads

Section 1: Introduction

The Florida Fish and Wildlife Conservation Commission (FWC) manages the lands in the Wildlife Management Area (WMA) system using a science-informed, proactive approach, which includes an understanding of natural communities of plants and animals. As applied by FWC, natural community management starts by classifying lands into distinct natural communities that we manage in a way to maintain or enhance the communities' unique structure and function. Land management that has a positive influence on natural community conditions benefits the wildlife living in these habitats.

While natural community management provides benefits to a host of species reliant upon these natural communities, imperiled species sometimes require specific attention. Additionally, subsection 253.034(5) of the Florida Statutes (F.S.) requires all land management plans to include an analysis of the property to determine if significant natural resources, including listed species, occur on the property. If significant natural resources occur, the plan shall contain management strategies to protect the resources. The Florida Forever Act (s. 259.105, F.S.) adds that all State lands that have imperiled species habitat shall include restoration, enhancement, management, and repopulation of such habitats as a consideration in the management plan.

FWC's Wildlife Conservation Prioritization and Recovery Program (WCPR) created this Wildlife Management Strategy for Suwannee Ridge Wildlife and Environmental Area (SRWEA) to document the area's role in wildlife conservation, to ensure the management needs for wildlife diversity on the WMA system are met, and to identify the appropriate species monitoring for the area. This Strategy provides land managers with information on management and monitoring actions that should be taken provided the necessary resources are available. By implementing the actions in this Strategy, FWC believes that management will promote the persistence of locally important species, aid in the recovery of imperiled species, and ensure staff are managing all wildlife species on the area for their long-term well-being and for the benefit of people.

Section 2: Historic, Current, and Planned Management

FWC acquired SRWEA in 2002 with funding from the Mitigation Park program. All the WEAs established through this program are managed primarily to protect and enhance habitat important to upland endangered or threatened wildlife, especially the gopher tortoise (*Gopherus polyphemus*).#This acquisition totaled approximately 1,428 acres. For more details on acquisition, see the Suwannee Ridge WEA Management Plan.

Located in western Hamilton County, SRWEA is part of a mix of conservation lands, timber operations and agriculture. The southern border is the Holton Creek Conservation Area (HCCA), owned by Suwannee River Water Management District (SRWMD), the north and east borders silvicultural operations, and the west border is Skeeter Ranch, which is a grazing and timber operation.

Prior to state acquisition, resource management on SRWEA was primarily for timber, turpentine, and grazing cattle on native range. Evidence of previous land uses include the remains of a turpentine still, debris from a couple of homesteads, and a cemetery on the area, but land clearing for crops or pasture was minimal. There is evidence of some fire history on

the area, but it is unclear whether it was wildfire or controlled burning by the previous landowners. Despite the planting of off-site pine plantations most of the area retains the native groundcover, but there has been some hardwood encroachment that has suppressed the groundcover and inhibits prescribed burning. As a result, at the time of acquisition, SRWEA had stands of sand pine (*Pinus clausa*) plantation, older stands of slash (*P. elliotii*) and loblolly (*P. taeda*) pine plantations, and young stands of longleaf (*P. palustris*) pine plantations, but did not have extensive alteration to the groundcover.

2.1: Habitat Management

The primary actively managed natural community is sandhill, accounting for approximately 1,182 acres (Appendix 1). Other communities actively managed on the area include depression marsh (11 acres) and wet flatwoods (16 acres). The Florida Natural Areas Inventory (FNAI) with input from local and Habitat Assessment and Restoration Program staff produced natural community maps for SRWEA. The Objective Based Vegetation Management (OBVM) program monitors natural community condition to track progress towards meeting Desired Future Conditions (DFCs). FWC manages these communities with prescribed fire and mechanical and chemical vegetation control to achieve DFCs. Sandhill is the only natural community tracked by OBVM on SRWEA. The 2018 OBVM report concluded that natural community attributes were moving toward DFCs. Attributes that were not in DFCs, such as pine basal area (BA), woody shrub cover, and herbaceous cover, will all need time and continued application of fire to reach DFCs.

Since acquisition, the sand pine stands were clear cut and planted in longleaf pine and thinning is complete in the remaining stands of slash and longleaf. A timber inventory completed in FY 19-20 will be the basis for the development of a timber management plan to be completed in FY 20-21. Staff have made mechanical treatments a component of management on the area and have used mowing or mulching equipment to treat shrub encroachment on over 510 acres since the drafting of the 2010 WCPR strategy.

Staff use herbicides to control encroaching hardwood, shrubs, and non-native invasive species; however, non-native invasive species are not a widespread problem on SRWEA. Staff treat scattered individuals of Japanese climbing fern (*Lygodium japonicum*), chinaberry tree (*Melia azedarach*), and mimosa tree (*Albizia julibrissin*) as encountered. Since 2010, staff treated 5 acres and 19 separate individuals of invasive exotic plants.

Planned Management

Over the next 10 years, the focus of habitat management on SRWEA is enhancement of the sandhill community. The actions outlined below will improve habitat for several listed and locally important species that use sandhill, including the Bachman's sparrow (*Peucaea aestivalis*), Florida pine snake (*Pituophis melanoleucus mugitus*), gopher tortoise, and southern fox squirrel (*Sciurus niger niger*).

Timber Management

- Staff will follow the management recommendations provided in the timber management plan under development.
- Staff will continue planting longleaf pine in areas with native ground cover where BA is below desired levels.
- Staff will begin planting longleaf pine seedlings in thinned slash pine and loblolly pine stands with low BA to initiate conversion to longleaf.

Mechanical Treatments

- Staff will utilize understory brush mowing, especially in areas of low pine BA, to reduce height and coverage of woody species and to favor herbaceous species. All mechanical treatments will be followed with prescribed fire after fuels have cured.
- Staff will continue mowing brush along firebreaks where necessary.
- Staff will use appropriate equipment that minimizes ground disturbance and limit the use of heavy equipment use in sensitive areas.

Chemical Treatments

- Staff will utilize herbicide treatments to control invasive exotic vegetation (e.g., Japanese climbing fern, cogon grass [*Imperata cylindrica*], etc.).
- Staff will continue herbicide treatments where needed to control encroaching oaks until prescribed fire alone is enough.
- As needed, staff will utilize herbicide treatments as site prep to assist in establishing longleaf planting.

Prescribed Fire

- Staff will burn sandhill alone or in combination with one or more of the above actions, on a $\leq$3-year rotation.
- Staff will strive for a 2-year average fire return interval that incorporates seasonal variation including dormant and growing season fire.

Ephemeral Wetlands

- Staff will reduce shrub encroachment around wetland edges to facilitate burns carrying through wetland basins. Work will include hand clearing, cut-stump herbicide treatments, and foliar herbicide treatments.
- Staff will remove pine regeneration that volunteers in and around the wetland basin.
- In priority ephemeral wetlands, staff will apply fire when conditions will allow fire to burn through the wetland.

2.2: Monitoring

Monitoring recommendations in the 2010 Strategy included: conducting gopher tortoise surveys; grassland bird surveys for Bachman's sparrow, brown-headed nuthatch (*Sitta pusilla*), and northern bobwhite (*Colinus virginianus*); surveys for gopher frog (*Lithobates capito*); and opportunistically monitoring other species of interest. The gopher

frog was not documented on the area despite several herp array trapping efforts and gopher tortoise burrow scoping. Staff accomplished the monitoring recommendations for gopher tortoise and grassland birds during the 10-year lifetime of the Strategy and the results are discussed in Section 3. All wildlife monitoring data from SRWEA are available in the Wildlife and Habitat Management Section's (WHM) Sampling and Monitoring Protocol (SaMP) database and are available to other FWC sections and divisions, as well as cooperating agencies and organizations.

The 2010 strategy included several species to document if detected. Of these, southern fox squirrel is documented in nearly all management units, swallow-tailed kite (*Elanoides forficatus*) and southern bald eagle (*Haliaeetus leucocephalus*) were observed, but nesting was not confirmed, and no detections were made of limpkin (*Aramus guarauna*) or Cooper's hawk (*Accipiter cooperii*). The Florida pine snake was documented, and the subject of a research effort discussed in Section 3. There are 4 wood duck (*Aix spinosa*) boxes on 2 ponds that staff clean and maintain annually. Staff installed 1 bat house in 2018 and subsequent monitoring has not detected use.

Species Specific Monitoring

Some species warrant dedicated monitoring for one or more reasons. Imperiled species that are rare or declining may justify a dedicated effort to monitor local populations. In other cases, the species being monitored fulfills a role as an indicator species, a species whose presence indicates well managed natural communities that will also benefit other species. All species monitoring events are recorded in the appropriate protocol within SaMP. The Area-Specific Species Assessments (Section 3) contain more details about these monitoring actions. Species to be monitored specifically during the 10-year Strategy are:

- Gopher tortoise
- Grassland birds

Species Inventories

Conducting periodic inventories on lands within the WMA system accomplishes several purposes. Inventories enable staff to provide an up-to-date species list for the area and enhance species lists for cryptic, fossorial, or nocturnal species that for which detection on the area by opportunistic observations is unlikely. Additionally, conducting an inventory may be a more efficient way to document species occurrence than other methods, such as opportunistic monitoring.

During the 10-year lifetime of this Strategy, staff will conduct taxa inventory surveys for the main terrestrial vertebrate species as resources allow. Surveys on SRWEA will include breeding, migratory and resident (winter) bird point counts, wetland surveys with dip-nets for…, a herp survey, a small and mesomammal survey, and an acoustic bat survey. Staff will conduct inventory surveys in all major natural communities represented on the area to generate as complete a species list as possible. Some techniques under consideration to ensure documenting as many species as possible include: mesomammal camera trap surveys or detection dogs; adding pitfalls, coverboards and PVC pipe traps (to detect treefrog species) to herp arrays; and using minnow traps in addition to dip net surveys in wetlands. These additional surveys or enhancements will depend on the availability of adequate resources and

the likelihood of documenting additional species that are not known to occur on the area. All data collected in these inventory monitoring events will be recorded in the appropriate database within SaMP.

Document Occurrence

To improve the area-specific documented species list, staff document opportunistic observations of species when encountered. While staff only need to enter opportunistic observations for common species on an occasional basis, there are other species for which staff should document every encounter. Collecting this information will help further our understanding of species' ranges statewide as well as the area's role in the conservation of these species. Observations of these species are recorded when encountered using WHM's Opportunistic Observations for Wildlife protocol and the data entered into SaMP. It is not necessary to fill out the opportunistic monitoring form if observations of these species are collected as part of another monitoring effort (e.g., herp arrays). Species identified for opportunistic monitoring are:

- Ornate chorus frog (*Pseudacris ornata*)
- Gopher frog (*Lithobates capito*)
- Eastern diamondback rattlesnake (*Crotalus adamanteus*)
- Eastern indigo snake (*Drymarchon couperi*)
- Eastern kingsnake (*Lampropeltis getula getula*)
- Florida pine snake (*Pituophis melanoleucus mugitus*)
- Southern hog-nosed snake (*Heterodon simus*)
- Imperiled wading birds (nesting colonies)
- Short-tailed hawk (*Buteo brachyurus*)
- Southeastern American kestrel (*Falco sparverius paulus*; breeding season, mid-March to July)
- Southern bald eagle (*Haliaeetus leucocephalus*, nests only)
- Swallow-tailed kite (*Elanoides forficatus*; nests only)
- Eastern spotted skunk (*Spilogale putorius*)
- Florida long-tailed weasel (*Mustela frenata peninsulae*)
- Homosassa shrew (*Sorex longirostris eionis*)

Section 3: Species Assessments

Creating species assessments for locally important species on SRWEA involved several steps. First, WCPR staff created a list of locally important species for the area (Appendix 2), starting with the listed and recently delisted species in the Imperiled Species Management Plan (ISMP) that are known to occur or could potentially occur on the area. Staff then considered adding additional species to this list, including: species that were identified in the area's purpose for acquisition; species for which staff conduct significant monitoring or management for conservation, recreation, or public-viewing purposes; candidates for federal listing; species recognized as habitat management indicators, keystone

species, or umbrella species; and species for which occurrence data are lacking. In addition to the ISMP, references used by staff creating the list included: statewide potential habitat models created by FWC's Fish and Wildlife Research Institute using Cooperative Land Cover V.3.2; agency documents such as Regional Assessments, the previous WCPR Strategy and the area's Management Plan; and input from local staff and species experts.

After creating the species list, WCPR staff drafted assessments outlining proposed management actions for each species (except those for which documenting occurrence was the only needed action identified by experts). Then staff conducted a workshop, held September 15-16, 2020, at which area managers, species experts, and section leaders reviewed the draft species assessments and discussed SRWEA's potential role in the conservation of locally important species. To determine management actions needed for each species, workshop participants considered the species' status on the area; the current condition of the area's natural communities; the amount and spatial arrangement of the species' potential habitat on the area and adjacent lands; the species' response to management; and any local overriding factors (e.g., status of species in the region, local declines or extirpations). Additionally, staff considered management actions identified in FWC's Species Action Plans (SAPs), Regional Assessments, and the area's Management Plan. Using the information from the workshop, staff drafted the Strategy and sent it to species experts and other stakeholders for review. Following the review, the Strategy is finalized and is implemented by staff.

This section summarizes the assessment for each species discussed in the workshop and the actions agreed on by workshop participants. Each assessment outlines the species' status on the area and the current condition of its habitat, planned habitat management actions, planned monitoring actions, and the area's role in conservation of the species. In addition, some assessments may identify species management recommendations, which refer to actions such as translocation, restocking, or installing artificial cavities.

3.1: Gopher Tortoise

Current Condition: The gopher tortoise is state-Threatened and a candidate for federal listing, making it a high statewide priority. The gopher tortoise is a keystone species because its burrows benefit numerous other species. FNAI conducted a Line Transect Distance Sampling (LTDS) survey in September 2016 and estimated the population density at 0.73 tortoises per acre; translating to approximately 831 individuals distributed over 1,136 acres of sandhill habitat. Surveyors determined the size distribution indicated a healthy population with recent recruitment. Previous surveyors used a different methodology in 2004 and 2011, resulting in estimated densities of 1.07 and 1.03 tortoises per acre, respectively. In 2018 staff conducted a survey using the methodology of 2004 and 2011 and estimated a density of 1.95 per acre. This high estimate was likely a result of surveying after a recent burn, increasing burrow detection and counting burrows that were outside of the prescribed transect width in the protocol.

The purpose of acquisition for SRWEA is to secure habitat for the gopher tortoise and other upland species as mitigation for habitat losses to land development activities. While this area did suffer habitat degradation due to fire suppression, the groundcover is intact and in good condition and will continue to improve with fire management. Frequent prescribed fire conducted every 1-3 years in upland habitat will improve conditions for this species. Staff will continue to emphasize short-rotation, growing season fire to minimize shrub encroachment and stimulate the preferred grassy herbaceous groundcover beneficial to tortoises.

Habitat Management: FWC's Gopher Tortoise Management Plan outlines actions to improve the status of the species. The plan recommends managing potential tortoise habitat to achieve the DFCs identified for FNAI reference sites, primarily using prescribed fire. As FWC's DFCs are the same as FNAI's, the current prescribed fire program will improve the quality of habitat for gopher tortoises.

Staff will follow established best management practices to prevent direct mortality and collapsing burrows during management activities, such as flagging burrows in advance of mechanical treatments that use heavy equipment. Since gopher tortoises are generally less active and remain in burrows during the winter months, staff will schedule mechanical treatments that use heavy equipment (e.g., roller chopping, timber harvesting) during the winter in sites where tortoises occur. In accordance with recommended best management practices, staff will continue to conduct activities during the winter to avoid disturbing burrow aprons during the time when eggs or hatchlings are most likely present (May-September), and when hatchlings are most abundant (September-October). However, they also consider how timing of the treatment will affect management results, as growing season treatments are frequently more successful in creating the diverse groundcover required by tortoises. When using contractors to conduct mechanical treatments, staff will ensure they take precautions to safeguard tortoises and burrows.

Monitoring: The next LTDS survey will occur in FY 2021-22 and current plans call for a follow-up LTDS survey in FY 2026-2027.

Area's Role: By continuing efforts to enhance or restore the structure and function of the sandhill natural community to better suit the gopher tortoise, SRWEA will fulfill the area's role in the recovery of this species. The area goal is to improve habitat quality and maintain a stable or growing population of gopher tortoises on the area.

3.2: Upland Snakes

Current Condition: The eastern indigo snake is a federally Threatened species commonly associated with sandhill and scrubby flatwoods. Indigo snakes also use mesic flatwoods, hardwood hammocks, marsh edges, and pasture. Gopher tortoise burrows are important refuge sites for indigo snakes and provide protection from cold and desiccation. Indigo snakes will also use cotton rat burrows, hollowed tree stumps and stump holes, ground litter, trash piles, and rock piles for refuge. Indigo snakes prey on many species, including nonvenomous and venomous snakes, small gopher tortoises, anurans, and mammals.

The Florida pine snake is state-listed as Threatened and the FWC approved a SAP (Florida pine snake SAP) for the species in 2013. Florida pine snakes are often found in sandhill and other xeric habitats. Pine snakes are fossorial and are often associated with southeastern pocket gopher (*Geomys pinetis*) burrows, but they will also use stump holes and the burrows of gopher tortoises, armadillos, and mice. The principal prey of pine snakes are pocket gophers, rabbits, and small rodents, but they occasionally eat ground-nesting birds and their eggs.

The eastern diamondback rattlesnake has been petitioned for federal listing and is usually found in pine savannas, open canopied forests, and grasslands, although they do use a variety of natural communities. Rattlesnakes also use stump holes and burrows as winter refuges. Rattlesnakes prey nearly exclusively upon mammals.

The southern hog-nosed snake is petitioned for federal listing and is another snake that is associated with xeric upland habitats. While not fossorial *per se*, they are good burrowers and typically catch their prey by excavating them from their burrows. The southern hog-nosed snake primarily feeds on anurans and lizards.

Three of these snake species of conservation concern associated with xeric upland habitats are known to occur on SRWEA. The Florida pine snake and eastern diamondback rattlesnake are documented on SRWEA. FWC staff documented the southern hog-nosed snake on the area during the recent Florida pine snake study in 2017-18. The eastern indigo snake is not documented on SRWEA.

The Florida pine snake study captured and implanted radio transmitters in 18 snakes (11 male and 7 female) on SRWEA. Snakes were located every 2-3 days for approximately 9 months. Objectives of the study included assessing home range, survival, habitat associations, and barriers to movement. This information can inform and provide management recommendations for forestry and agricultural operations.

Results of this study confirmed some expectations, but also produced some surprises. Home ranges were somewhat smaller than previous studies (~56 acres for males and ~38 acres for females). Florida pine snakes preferentially selected sandhill on SRWEA, as expected. Interestingly, when researchers relocated basking snakes, they were often "backed up" in shrubs, likely attempting to avoid detection by predators. Even on SRWEA, which is closed to vehicular traffic except during mobility-impaired hunts, Florida pine snakes crossed roads less frequently than expected if movements were random. Complete results from the study are available in the Section 6 Final report included in the SRWEA Sharepoint.

Because the area suffered fire suppression but not complete alteration, the current condition of SRWEA does meet the needs of these species, and conditions should continue to improve with continued management. Conditions on adjacent private land is less favorable, but the current mix of agriculture, silviculture, and low-density residential development is adequate for the persistence of these species.

Habitat Management: Current management for gopher tortoise habitat is beneficial to these species, and these species benefit from the continued use of prescribed fire on

SRWEA. Management actions that maintain or enhance habitat for these species include prescribed fire and mechanical treatments that restore natural community structure and function. Staff will continue to retain stumps, snags, and coarse woody debris during land management activities as potential refuge sites for snakes. Also, staff will retain some shrub clumps in sandhill to provide basking locations for Florida pine snakes. When pile burning, managers will light piles from only one side to allow snakes to escape.

Monitoring: Because an efficient monitoring technique does not exist for these species specifically, staff will document these species when observed. General herpetological drift-fence surveys will be conducted at least every 10 years on SRWEA. Drift-fence arrays in upland habitats should include large box traps in addition to funnel and pitfall traps, as this type of trap is more likely to capture large snakes. A survey in April-November 2014 using 2 drift-fence arrays trapped 152 snakes of 11 species, including 8 pine snakes and 1 diamondback rattlesnake. An additional species, the timber rattlesnake (*Crotalus horridus*), was found hiding under a funnel trap shade cover. During gopher tortoise surveys, surveyors could also document snakes using via burrow-scoping. While these surveys will not provide population-level information, they will document continued occupancy of SRWEA by these species.

Area's Role: The role of SRWEA is to enhance and maintain the suitability of habitat to support these species. Staff will ensure the area fulfills this role by continuing to restore the sandhill community through prescribed fire on a ≤ 3-year rotation, thinning timber as needed, and conducting mechanical and chemical treatments to reduce hardwood midstory as needed. However, even if FWC management continues to accommodate the needs of these species, the persistence of these species likely depends on management actions occurring on adjacent public and private lands. Staff will promote the use of prescribed fire, provide input to land use planning decisions, and maintain good relationships with neighbors to inform landowners about these species' needs.

3.3: Bachman's Sparrow

Current Condition: Bachman's sparrows are identified as an 'indicator species' whose continued presence indicates well-managed pine communities. Since 2014, SRWEA staff have conducted annual spring grassland bird surveys at 6 stations. During these surveys, staff documented Bachman's sparrows in all years. Bachman's sparrows have been recorded at 4 or more stations in all years and at all stations since 2018. Staff detect fewer sparrows at several stations where the longleaf is younger and the mid-story is denser, but the habitat is improving with each fire. Stations 4, 5, and 6 are in the southern half of SRWEA that borders the mature pine stands in the HCCA managed by the SRWMD. Surveys are not conducted on HCCA, where there is approximately 350 acres of habitat in good condition.

The Bachman's sparrow is a ground-nesting habitat specialist that is closely associated with natural communities containing diverse herbaceous groundcover maintained by frequent fire (≤ 3-year rotation). The species requires open spaces between grass clumps and spends most of its time on the ground. Potential habitat for this species on SRWEA

consists of sandhill and pine plantation communities. Although this area suffered habitat degradation due to fire suppression, the groundcover is intact and in good condition and will continue to improve with fire management. Frequent prescribed fire conducted every 1-3 years in upland habitat will improve conditions for this species. An emphasis on growing season burns will minimize shrub encroachment and stimulate the grassy herbaceous groundcover preferred for nesting.

Habitat Management: Frequent (≤ 3-year rotation) use of prescribed fire improves habitat quality for Bachman's sparrows, and is the primary land management tool used to restore, improve, and maintain habitat for the Bachman's sparrow. Fire is critical to sustaining this species, as use of an area by Bachman's sparrows declines rapidly around 18 months post-fire, and the species may abandon habitat if fire is excluded for >3 years. Since males use small shrubs as singing perches, staff will ensure that mechanical treatments retain some small patches of shrubs. Staff will continue to follow mechanical treatments with a prescribed burn to stimulate growth of grasses and forbs. Current land management actions designed to restore and maintain natural community structure and function within SRWEA will benefit Bachman's sparrow.

Monitoring: Since the Bachman's sparrow can serve as a habitat indicator, continued monitoring will help gauge the effectiveness of management efforts. Staff will continue to monitor for this species annually as resources allow. If staff is unable to sustain an annual monitoring approach, then they will adopt a protocol to take two years off between survey intervals, followed by two back-to-back survey years. By tracking trends in the relative abundance of Bachman's sparrows over time, staff can gauge the effectiveness of restoration efforts as habitat improves.

Area's Role: The role of SRWEA in the conservation of the Bachman's sparrow is to provide suitable habitat to support the regional population. The goal for this species is to maintain a viable, self-sustaining population that has the potential to function as part of a larger regional population. Staff will fulfill this role by continuing to maintain and restore the sandhill community through prescribed fire on a ≤ 3-year rotation, timber harvests to thin pines as needed, and mechanical and chemical treatments to reduce hardwood mid-story as needed.

3.4: Brown-headed Nuthatch

Current Condition: Like Bachman's sparrows, brown-headed nuthatches are identified as an 'indicator species' whose presence indicates well-managed pine communities, especially mature pine communities. Since 2014, SRWEA staff have conducted annual spring grassland bird surveys at 6 stations. During these surveys, staff documented brown-headed nuthatches in all years except 2017. Brown-headed nuthatches have been detected at all stations in at least one year and detected at station 4 most frequently. Stations 4, 5, and 6 are in the southern half of SRWEA and borders the mature pine stands in the HCCA managed by the SRWMD. Surveys are not conducted on HCCA, where there is approximately 350 acres of quality habitat in good condition. Much of the

potential habitat on SRWEA has younger stands of pine, but some stands do have mature timber. Many of the areas that currently support the Bachman's sparrow could support the brown-headed nuthatch in the future as pines mature.

This primary cavity nester prefers open stands of mature pines managed with frequent fire. Older pine forests (>35 years for longleaf or slash pine) and stands with BA between 35–50 ft^2/acre are suitable, although nuthatches can use pine stands with younger trees and higher BAs. Brown-headed nuthatches are weak excavators and they occasionally use cavities excavated by other species. This species prefers old decaying oaks with a diameter at breast height of <10 inches for cavity excavation but are known to nest in snags from other species, including pine. Snag protection during management activities can maintain suitable cavity trees for this species to excavate. As timber is thinned and remaining trees mature, habitat conditions will improve for this species.

Habitat Management: Brown-headed nuthatches prefer snag-rich communities, maintained by prescribed fire on a ≤ 3-year rotation. Staff will continue efforts to restore pine communities through prescribed fire on a 1-3-year rotation, timber harvests to thin pines as needed, and mechanical and chemical treatments to reduce excess hardwood midstory, while retaining some hardwoods to provide for future snags. Snags will generally be produced by prescribed fire activity, but if necessary, staff may choose to either girdle or use herbicide on select hardwoods to create new snags.

Monitoring: Staff will continue to monitor for this species annually as resources allow. If annual monitoring becomes unsustainable, staff will implement using the updated protocol calling for a 2-year survey period, then skipping 2 years. Currently, surveys are conducted in May and June during the latter part of the window for conducting the spring grassland bird survey. Shifting survey dates earlier in the window to April, will result in a higher probability of detecting the brown-headed nuthatch on site.

Area's Role: The role of SRWEA for the brown-headed nuthatch is to provide suitable breeding and foraging habitat to contribute to conservation of the regional population. Staff will fulfill this role by continuing to restore pine communities through prescribed fire on a ≤ 3-year rotation, timber harvests to thin pines as needed, and mechanical and chemical treatments to reduce hardwood midstory, while retaining some oaks to provide for future snags.

3.5: Southern Fox Squirrel

Current Condition: At the time of the drafting of the 2010 SRWEA WCPR Strategy, taxonomists considered the Sherman's fox squirrel (*S. n. shermani*) a valid subspecies, which the FWC listed as a Species of Special Concern. The 2017 biological status review (BSR) found that, based on the new genetic information, the Sherman's fox squirrel is not genetically different from the southern fox squirrel (*S. n. niger*) or Bachman's squirrel (*S. n. bachmani*) in Florida. Taxonomically, it was thus appropriate to group all fox squirrels in Florida north of the Caloosahatchee River as the southern fox squirrel, *S. n. niger*. The

southern fox squirrel did not meet the criteria for listing, and the BSR recommended removing the subspecies from the imperiled species list.

In 2019, FWC approved and adopted a revised Southern Fox Squirrel SAP that proposes the creation of Species Focal Areas to focus conservation efforts. SRWEA falls within the Suwannee Ridge Species Focal Area described in the SAP. Fox squirrels are common on SRWEA, and sightings occur throughout the WEA. The size and status of the regional population on SRWEA and adjacent private properties is unknown.

While previous landowners managed short rotation pine plantations, reducing the number of mature trees fox squirrels prefer, FWC's current management - restoring longleaf pine and managing for older trees - will benefit fox squirrels. Current management for gopher tortoise habitat is beneficial to southern fox squirrels. Frequent prescribed fire conducted every 1-3 years in upland habitat will improve conditions and maintain the open grassland habitat preferred by fox squirrels. In addition to conducting frequent prescribed burns, management recommendations for this species include retaining site-appropriate mast-producing hardwoods to provide nest trees and a diversity of forage.

Habitat Management: Suitable habitat for fox squirrels includes longleaf pine sandhills or flatwoods with the best habitat in areas with a mixture of pines and oaks, such as along the edges of longleaf pine savannas and turkey oak (*Quercus laevis*) forests. Management actions that maintain or enhance habitat for this species include prescribed fire, natural community restoration, and management that favors mature stands of longleaf pine with the retention of mast-producing hardwoods (e.g., hickories [*Carya spp.*] and white oaks [*Quercus spp.*]). Recent studies in habitat occupied by fox squirrels report 10-12% hardwood cover. As such, the management described in Section 2 is compatible with the needs of this species. It is unlikely the management area could independently sustain a population, so the long-term viability of the southern fox squirrel is dependent on land use choices made by surrounding land managers.

Monitoring: Experts did not identify SRWEA as a high priority for squirrel monitoring. Currently, there are no plans for specific monitoring of fox squirrels. Staff should document opportunistic observations of southern fox squirrel nests, with juveniles, or in novel areas.

Area's Role: By continuing to provide suitable foraging and nesting sites for southern fox squirrels, SRWEA can fulfill its role in the regional conservation of the species. SRWEA staff will fulfill this role to support the regional conservation of squirrels by applying planned natural community-based management.

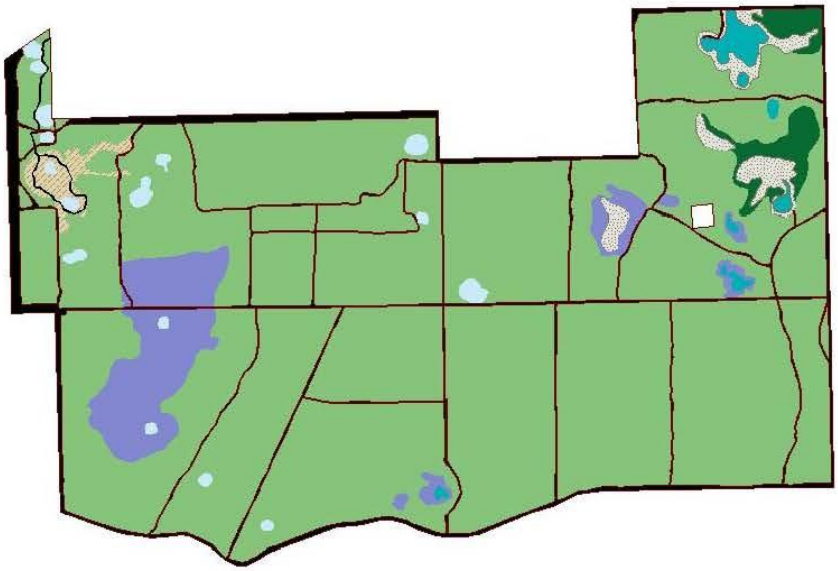
Section 4: Coordination and Beyond the Boundaries Considerations

As discussed in the above assessments, several locally important species could potentially disperse between SRWEA and neighboring lands. Considering SRWEA together with the current condition and management of neighboring lands provides an opportunity to further the conservation of many local and imperiled species.

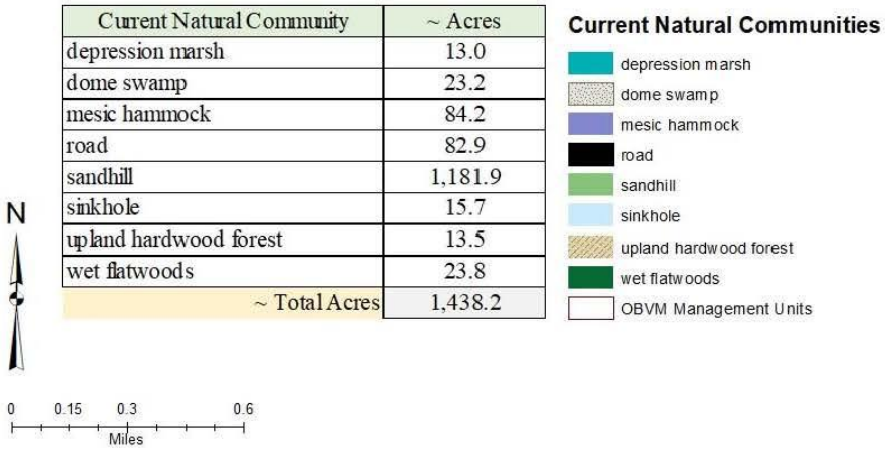
The southern boundary of SRWEA adjoins HCCA, public land managed by the SRWMD. The HCCA includes approximately 350 acres of upland pine habitat that is adjacent to habitat occupied by the locally important species on SRWEA. Currently, SRWMD manages these acres with prescribed fire on a 3-year rotation. The SRWMD has a district-wide land management plan that guides management activities on their lands. These principals are complementary to the FWC's natural community management philosophy and are compatible with management for the species discussed in this strategy. The HCCA will contribute to the conservation of these species unless there are significant changes to the SRWMD management philosophy.

Private lands managed more intensively for grazing and silviculture border the north, east and west boundaries of SRWEA. These lands provide some value as habitat for many species and are a buffer against more developed or intensively managed lands. However, significant changes in management or land use beyond the boundaries may have a significant impact on some species. Species that require large home ranges or are dependent on dispersal for maintaining a population are particularly affected by adjacent land management. Many of the species that inhabit xeric uplands depend on the availability of suitable habitat on adjacent private lands. As such, the actions of adjacent landowners will determine if some of these focal species persist on SRWEA. Area staff should make every effort to establish cordial relationships with adjacent private landowners. Area staff will engage with staff from the Office of Conservation Planning Services to ensure that cooperative private landowners receive technical assistance for applying conservation practices on their lands. The SRWEA Management Plan addresses the optimal conservation planning boundary and has more information on tools available to interested landowners for technical assistance, cost-sharing opportunities, and conservation easement programs.

Appendix 1. SRWEA Natural community map with GIS-based acres.



Current Natural Community	~ Acres
depression marsh	13.0
dome swamp	23.2
mesic hammock	84.2
road	82.9
sandhill	1,181.9
sinkhole	15.7
upland hardwood forest	13.5
wet flatwoods	23.8
~ Total Acres	1,438.2



Appendix 2. SRWEA locally important species.

Species	Location in Document
Bachman's sparrow (*Peucaea aestivalis*)	Species Assessments
Brown-headed nuthatch (*Sitta pusilla*)	Species Assessments
Eastern diamondback rattlesnake (*Crotalus adamanteus*)	Species Assessments
Eastern indigo snake (*Drymarchon couperi*)	Species Assessments
Eastern kingsnake (*Lampropeltis getula getula*)	Document Occurrence
Eastern spotted skunk (*Spilogale putorius*)	Document Occurrence
Florida long-tailed weasel (*Mustela frenata peninsulae*)	Document Occurrence
Florida pine snake (*Pituophis melanoleucus mugitus*)	Species Assessments
Gopher frog (*Lithobates capito*)	Document Occurrence
Gopher tortoise (*Gopherus polyphemus*)	Species Assessments
Homosassa shrew (*Sorex longirostris eionis*)	Document Occurrence
Imperiled wading birds (multiple species)	Document Occurrence
Northern bobwhite (*Colinus virginianus*)	Monitoring
Ornate chorus frog (*Pseudacris ornata*)	Document Occurrence
Short-tailed hawk (*Buteo brachyurus*)	Document Occurrence
Southeastern American kestrel (*Falco sparverius paulus*)	Document Occurrence
Southern bald eagle (*Haliaeetus leucocephalus*)	Document Occurrence
Southern fox squirrel (*Sciurus niger niger*)	Species Assessments
Southern hog-nosed snake (*Heterodon simus*)	Species Assessments
Swallow-tailed kite (*Elanoides forficatus*)	Document Occurrence
Wood duck (*Aix spinosa*)	Monitoring

11.15 Forest Management Plan

FOREST MANAGEMENT PLAN

SUWANNEE RIDGE

WILDLIFE AND ENVIRONMENTAL AREA (WEA)

June 7, 2021

Mr. Matthew Barker
FWC Project Manager
Florida Fish and Wildlife Conservation Commission
NE 120th St. Road
Branford, FL 32008

RE: FOREST MANAGEMENT PLAN FOR SUWANNEE RIDGE WEA

Dear Matthew:

Attached please find the Forest Management Plan for the Suwannee Ridge WEA.

A flash drive with Excel files and a PDF and Word version of the Forest Managment Plan will be sent to the Branford office.

With Best Regards,

John Bogue
The Forestry Company
850-843-1192

THE FORESTRY COMPANY

FOREST MANAGEMENT PLAN
SUWANNEE RIDGE WEA

Prepared for:

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Prepared by:
John Bogue, Forest Inventory Manager
and
Michele Curtis, Forester

THE FORESTRY COMPANY
502 West Green St.
Perry, FL 32347

Date of the Report: June 7, 2021

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FOREST MANAGEMENT PLAN
FOR SUWANNEE RIDGE WEA



I. Project Objectives

The Florida Fish and Wildlife Conservation Commission (FWC) contracted with The Forestry Company (TFC) in the 2nd quarter of 2021 to provide forest management planning services on several Wildlife and Environmental Areas (WEA), including Suwannee Ridge WEA.

1) Management Goals were provided by the FWC: The overarching goals for actively-managed natural communities are to:
   a) restore them to reference habitat conditions in which compositional, structural and functional components are present,
   b) help sustain ecological processes needed for perpetuation of all naturally occurring native vegetative species,
   c) increase resiliency to disturbances including climate change, and 4) provide high quality wildlife habitat for imperiled species, with primary emphasis placed on the gopher tortoise (*Gopherus polyphemus*).

2) Long-term restoration targets are:
   a) creation of spatially heterogeneous management units that include irregular, uneven- or all-aged stands;
   b) differentiation into distinct crown classes, size classes and distributions of trees;
   c) conversion of pure stands to ones of mixed species, composed primarily of longleaf pines; and,
   d) perpetual regeneration of fire-maintained forest stands. Target objectives for restored, forested natural communities call for pine over-stories composed predominately of longleaf pine.

Pine stands in the Suwannee Ridge Wildlife and Environmental Area (WEA) units are comprised of sandhill and are now dominated by natural or planted longleaf pine. Whereas pine stands in other management units comprised of pine flatwoods are now dominated by plantations of slash pine and, less frequently, loblolly pine.

3) Intermediate-term objectives for plantation pine are to:
   a) drive stands toward composition (species frequency) that is dominated by longleaf pine;
   b) create or maintain fine fuel conditions that promote safe, routine, and perpetual use of prescribed fire; and
   c) create structural diversity within or among management units.

   Desired Pine Basal Area Per Acre is 30-60 ft2/ac. Harvesting should be done so as to create small gaps, each <0.25 acres in size, scattered throughout the stand. The goal of progressing stands toward longleaf pine dominated multi-aged management should be the priority. The use of prescribed fire for stand development and future maintenance must be incorporated.

A systematic cruise, using 10 Basal Area Factor (BAF) prism variable plot radius prism points, was conducted in 2020, for all pine dominated timber stands on the area. This information was used to help guide management decisions for the forest management plan.

II. Resource Assessment

A. Geographical

The Florida Fish and Wildlife Conservation Commission property being addressed in this report is the Suwannee Ridge WEA. The Suwannee Ridge WEA Property is maintained by the Florida Fish and Wildlife Conservation Commission (FWC) and contains 1,202.7 GIS acres more or less (MOL) of land in Hamilton County, Florida. It is located south of Jennings, north of Live Oak, and southwest of Jasper, FL. The property is accessed from County Road (CR) 249. The entrance is on the northwest corner of the property along CR 249. The tract Location map (Figure 1) is found in the Figure section of the report.

B. Climate

Hamilton County receives 52 inches of rain, on average, per year. The US average is 38 inches of rain per year. Precipitation, on average, occurs 93 days per year. On average, there are 227 sunny days per year in Hamilton County. The US average is 205 sunny days. Summer highs are in July around 92 degrees and Winter lows in January are usually around 38 degrees.

C. Soils

As classified by the "Florida Natural Areas Inventory" (FNAI), Suwannee Ridge WEA is considered sand hill. The majority of the soils are Alpin sand, 0 to 5% slopes (44%) and Blanton sand, 0 to 5% slopes (35%). Alpin sand is excessively well drained and the Blanton sand is moderately well drained. Both soil types are well suited for longleaf pine. The soils map and legend (Figures 2 and 3) are found in the Figure section of the report.

D. Hydrology

There are several low depressional areas and no perennial streams on the site. The majority of the depressional areas appear to be intermittent and fill/empty depending on rainfall and the season. However, there is one depressional area that may be considered a sink hole near the northwest entrance to the site.



Low Depressional Sink

E. Pine Species Suitability

The Suwannee Ridge WEA site is considered sandhill by Florida Natural Areas Inventory (FNAI). Longleaf pine will flourish on this dry and sandy landscape. This type site is also optimal for the gopher tortoise (*Gopherus polyphemus*).



Gopher Tortoise (*Gopherus polyphemus*).

F. Historic Uses

The upland forests were managed as timber income producing sites prior to being acquired by FWC. The longleaf planted pine stand thinnings on the tract took place in 2004, 2017 and 2018.

G. Current Conditions

This property is now used for habitat and species conservation as well as public recreation. The northern end of the property has a secured entrance and parking area for visitors.

There has been no recent tree planting and very little natural regeneration of longleaf pine was observed. Stand SR08-2 looks like the youngest planted longleaf stand, with most longleaf pine trees less than 10' high. Most units have been prescribed burned within the last several years resulting in moderate to low fuel loads. Hardwoods in stand SR 09-2 have been treated with herbicides to open up the stand, such that the longleaf pine stands have a better chance of naturally regenerating with the forest canopy cover being reduced. Stand SR01-2 has a lot of hardwood in the northern-most block near the entrance to the site, thus stressing the longleaf pine due to shade and competition for nutrients and water from the hardwood component of the forest. This is apparent by the smaller diameters and heights of the longleaf pines planted in the area with a lot of competing hardwood trees, as compared to longleaf pines planted on the same soils, at the same time, without competing hardwood trees, which appear larger.

The understory in the majority of the other units is very minimal and dominated by native grasses, ferns and gallberry. Firebreaks and/or roads provide unit/boundary buffers during controlled burns.

Access through the WEA is excellent due to a lightly traveled road system and due to limerock stabilized roads. The roads throughout this tract and along the boundary lines are in good condition. Even during the wettest times of the year, the roads can be navigated as water drains quickly on this sandy site.

The Suwannee Ridge WEA Forest Management Plan covers only areas that are considered "Pine Dominant" sandhills totaling 1,202.7 GIS acres more or less (MOL). The Florida Natural Areas Inventory (FNAI) found that, prior to intensive forestry production, portions of, or entire stands or management units were occupied primarily by sandhill species of oak and longleaf pine.

III. Project Methodologies

A. Project Area

The pine stands that were to be included in the management plan were identified as Management Unit/StandID by the FWC staff.

B. Data Provided by FWC

The FWC provided The Forestry Company (TFC) staff with timber stand information, boundary maps, burn unit information, GIS shape files, timber cruise reports, Tcruise TCD files and Excel stand lists. It's assumed that the FWC provided all information associated with the timber inventory that took place in 2020 to TFC.

C. Information Utilized by The Forestry Company Staff in Developing the Forest Management Plan

In late spring/early summer of 2020 the FWC requested bids to inventory the timber on five WEAs in north Florida, one of which was Suwannee Ridge WEA. The *Timber Inventory Sampling Design and Forest Inventory Technical Specifications* used to guide the timber inventory process are included as Attachment 1 at the end of this report for reference. TFC utilized the data from that timber inventory to model timber stand growth with the *Sims09* timber growth simulation software.

Prior to commencing field work, slash pine and longleaf pine natural regeneration research articles were reviewed and foresters managing longleaf restoration tracts were contacted to discuss their successes and failures with actual restoration efforts. Forest inventory data, growth modeling simulations, field observations, information from literature, training workshops, personal contacts and personal experience were utilized in developing the forest management recommendations that follow.

IV. Forest Management Plan

A. Desired Future Conditions:

The overarching goals for actively-managed natural communities are to:

1) restore them to reference habitat conditions in which compositional, structural and functional components are present,
2) help sustain ecological processes needed for perpetuation of all naturally occurring native vegetative species,
3) increase resiliency to disturbances including climate change, and
4) provide high quality wildlife habitat for imperiled species, with primary emphasis placed on the gopher tortoise (*Gopherus polyphemus*).

Target objectives for restored, forested natural communities call for pine overstories composed predominately of longleaf pine within a basal area range of 30-60 ft^2/acre; with small openings of less than ¼ acre in size scattered throughout the tract; fine fuel conditions that promote safe, routine, and perpetual use of prescribed fire; and structural diversity within or among management units.

FWC wants to manage the pine forests with prescribed fire with natural regeneration of the longleaf forest as the primary method of forest sustainability, to aide in habitat and species conservation, as well as providing public recreation opportunities.

The short-term objective of the longleaf pine Suwannee Ridge WEA Forest Management Plan is to develop a plan for the next 25 years to thin, plant or maintain existing stands to move toward the desired future conditions described above. The ultimate objective is to restore the naturally regenerating historical forest species mixes as follows.

Sandhills were historically a low density of longleaf pine, slash pine, sand live oak, scrub oaks, myrtle oak, and Chapman's oak overstory; with saw palmetto and wiregrass as the understory. The targeted basal area for the longleaf pine after thinning is 30-60 square feet per acre.

B. Forest Management Plan Development:

TFC foresters visited each pine timber stand in the field to look at the forest conditions, look at the amount of natural regeneration of longleaf pine present, consider the field evidence of prescribed burning, consider the timber cruise data and all other data provided by the FWC. Based on all of those observations and data, the forester developed recommendations, if implemented, should move each stand toward a naturally regenerating historical sandhill longleaf pine forest species mix.

The following pages will include a description of activities and maps illustrating the locations of certain forest management plan treatment recommendations.

The management plan treatment recommendations were grouped into five-year periods of time, specifically as *Period 1* (2020-2024), *Period 2* (2025-2029), *Period 3*(2030-2034), *Period 4*(2035-2039) and *Period* 5(2040-2044).

The forest management Treatment Codes (H, BPO, M, RE and T) recommended in this report are tailored to the condition of the forest when inventoried in 2020. These treatment codes will be referenced in several tables in the Addenda: Table 1-*Suwannee Ridge stands list and Recommendations;* Table 2 – *Suwannee Ridge WEA Summary Table of Recommendations;* and Table 3 – *Treatment Recommendations for Restoring Pine Forests at Suwannee Ridge WEA*. **BPO** stands for **B**urn and **P**lant in the **O**pen areas. **H** stands for **H**erbicide. **M** stands for **M**aintain current forest conditions. **T** stands for **Thin stand to the desired basal area. RE** stands for **Reevaluate the pine stand.**

V. Recommendations

A. Site Index and Processing Growth and Yield

Site index information was provided to The Forestry Company from the 2020 timber inventory cruise. The site index and timber inventory data was utilized in **SIMS 09** growth and yield simulation modeling software to predict future growth and yield of the timber stand. However, SIMS cannot model growth past tree age 50. As a result, the forester considered other data for some older stands.

B. B. Pine Stands

Pine stand overview and recommendations are found in the following pages. Each stand will be identified by its stand code, generally described and followed by a picture of the current stand. A recommendation will be rendered that can be specifically referenced in the Addenda as follows: Table 1 – Suwannee Ridge WEA Stands List and Recommendations, Table 2 - Suwannee Ridge WEA Summary Table of Recommendations, and Table 3 – Treatment Recommendations for Restoring Pine Forests at Suwannee Ridge WEA, and Treatment Code Specifics.

The Suwannee Ridge Management Units/Stands are small in acreage size. Below is the prescription for each one along with photographs taken on May 11, 2021. All prescribed burning is assumed to be on a 3-year frequency in all Management Units, unless changed by longleaf seeding or planting, budgets, or weather.

Thinning recommendations take into account the need for operational considerations as follows. Loggers will not typically harvest wood if they cannot harvest at least one truck load per acre or 28 tons/acre; which is approximately 28 BA. Thinnings are scheduled if half of the volume can be removed and the remaining volume in the forest is at least 35 BA. This leaves the thinned forest meeting the FWC lower target for stand density. It also leaves room for the forest to naturally regenerate creating an uneven-aged forest, and grow a number of years before it needs to be thinned again.

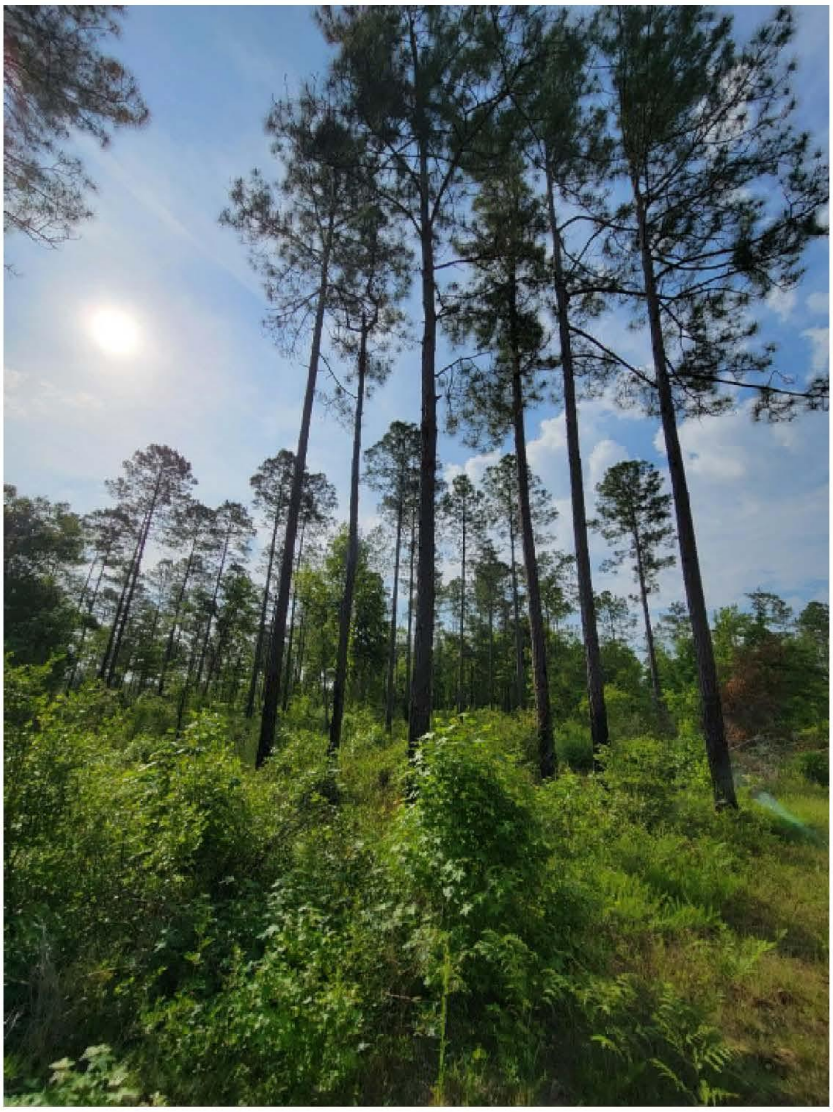
Qualitative inspections of each Management Unit were also conducted on May 11, 2021. Many of the Management Units need more longleaf understory to achieve the desired multi-

aged stands within the Units. Five Management Units have recommended longleaf planting in Period 1(2020-2024) in an effort to move the process forward in either establishing longleaf in the stand or to add another age class to the low stocking-mature longleaf stands. The young planted longleaf stands will eventually be thinned and then should produce seed to support natural regeneration in those stands to create the uneven-aged future stand. These prescriptions and the 2020 timber inventory data are summarized in Table 1- Suwannee Ridge WEA Stands List and Recommendations and are found in the Addenda.

SR01-1: This is a 40.6 acre mature, planted slash pine stand that was established in 1981 and thinned heavily in 2004. The 2020 stand basal area (BA) was 25.6 ft^2 and there were, on average, 28 merchantable slash pine trees per acre inventoried, with no natural regeneration. It is likely that the burn regime has been killing the natural slash pine regeneration as no pre-merchantable trees were inventoried in 2020. Slash pine is a fire intolerant species thus, this is not a surprise.

It is for that reason that it is recommended to burn and plant longleaf pine containerized seedlings at a rate of 300 trees per acre in the openings (BPO treatment code) as soon as possible (2020-2024). This will be the start of the future mixed longleaf and slash pine forest. The post plant burns should start no sooner than 2 years after planting and be cool enough to protect the newly planted trees until they begin to emerge from the grass stage. The stands should then be maintained (M treatment code) with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2025-2044). The stand should be reevaluated (RE treatment code) in the 5^{th} period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.

The Sims 09 growth and yield modeling software only projects tree growth to age 50 as older forest stands were not part of the model development; and the projections past tree age 50 are not valid. While the model would not project growth past tree age 50 for the existing stand, it is anticipated that longleaf trees planted in the 2020-2024 time period may provide sufficient volume, along with the current mature stand and any natural regeneration to warrant thinning in the future. It is for that reason that the stand should be reevaluated (RE treatment code) in the 2040-2044 time period to determine if thinning would be appropriate in the future years.



SR01-1

SR01-2: This is a 28-acre pre-merchantable planted longleaf pine stand that was established in 2004 and never thinned. The 2020 stand basal area (BA) was 18.75 ft^2 and there were, on average, 109 merchantable and 88 pre-merchantable longleaf pine trees per acre. There is no natural regeneration present as the stand is too young to produce seed in most situations. Part of the stand has dense hardwood encroachment.

It is for that reason that it is recommended to apply herbicide to competing hardwood trees using spot spray or hack 'n squirt application methods (depending on tree size) during the first period (2020 – 2024). Wait until the hardwoods are dead before burning, then maintain (M treatment code) the stand with prescribed fire approximately every 3 years for the 2nd and 3rd periods (2025-2035).

The Sims 09 growth and yield model predicts that there will be sufficient volume in the longleaf plantation to thin it in the 4th period (2036 – 2039). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 36ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2036 thin is approximately $16,111 or $6,694 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code) during the 5th time period (2040-2044).



SR01-2, picture 1



SR01-2, picture 2

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SR02-1: This is a 128.04-acre pre-merchantable planted longleaf pine stand that was established in 2005 and never thinned. The 2020 stand basal area (BA) was 12.76 ft^2 and there were, on average, 78 merchantable and 106 pre-merchantable longleaf pine trees per acre. There is no natural regeneration present as the stand is too young to produce seed in most situations.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years for the 1st through 4th periods (2020-2039).

The Sims 09 growth and yield model predicts that there will be sufficient volume in the longleaf plantation to thin it in the 5th period (2040 – 2044). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 35ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2044 thin is approximately $63,360 or $18,710 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code) during the 5th time period (2040-2044).



SR02-1

SR03-1: This is a 69.01-acre pre-merchantable planted longleaf pine stand that was established in 2004 and never thinned. The 2020 stand basal area (BA) was 4.55 ft^2 and there were, on average, 23 merchantable and 64 pre-merchantable longleaf pine trees per acre. There is no natural regeneration present as the stand is too young to produce seed.

It is for that reason that it is recommended to burn and plant longleaf pine containerized seedlings at a rate of 300 trees per acre in the openings (BPO treatment code) as soon as possible (2020-2024). This will be the start of the future uneven-aged longleaf pine forest. The post plant burns should start no sooner than 2 years after planting and be cool enough to protect the newly planted trees until they begin to emerge from the grass stage. The stands should then be maintained (M treatment code) with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2025-2044). The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.

The Sims 09 growth and yield modeling software projects tree growth of the existing stand may be approaching the minimum BA target of 30ft^2 in 2044. The longleaf planted in the first period (2020-2024) combined with the 2004 planting may be approaching the density where thinning is a viable option by 2040. It is for that reason that the stand should be reevaluated (RE treatment code) in the 2040-2044 time period to determine if thinning would be appropriate in the future years.



SR03-1

SR03-2: This is a 20.3-acre merchantable planted longleaf pine stand that was established in 1990 and thinned in 2017 by removing the 5th row and selectively thinning the leave rows. The 2020 stand basal area (BA) was 40 ft^2 and there were, on average, 110 merchantable and no pre-merchantable longleaf pine trees per acre. No natural regeneration was found in the 2020 timber cruise.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2020-2029). Prescribed burns need to be timed to support natural regeneration. The longleaf cones take 2 years to develop, thus when the forest manager sees conelets beginning to develop on the longleaf trees, the manger should plan a burn to take place in September of the 2nd year, just before the seeds are released from the cones. Longleaf pine seed needs bare mineral soil to germinate. This strategy will provide the best chance for natural regeneration to occur. If the forest manager notices a robust germination of longleaf pine seed, the burns should resume no sooner than 2 years after germination and be cool enough to protect the naturally regenerated trees until they begin to emerge from the grass stage. While longleaf pines are protected by a fire tolerant apical bud, they are fragile and can be killed by a hot fire before they are well established.

The Sims 09 growth and yield modeling software projects sufficient volume to thin the stand in the 3rd period (2030-2034). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 35ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2031 thin is approximately $15,488 or $8,214 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code) during the 4th and 5th time period (2035-2044).

The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to maintain the FWC's density target for longleaf forest.



SR03-2

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SR04-1: This is a 78.9-acre planted longleaf pine stand that was established in 1982 and thinned in 2004. The 2020 stand basal area (BA) was 30 ft^2 and there were, on average, 44 merchantable, 19 pre-merchantable and 156 naturally regenerated longleaf pine trees per acre.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years for the 1st through 5th periods (2020-2044).

The Sims 09 growth and yield model predicts that there will be approximately 48 BA in the longleaf plantation at age 50 (2035). Since Sims does not model growth above age 50 due to lack of data to create the projections, the forester applied a low growth rate of 1ft^2 BA per year to all years above age 50 to approximate BA of trees in the forest stand. Additionally, there will likely be natural regeneration of the pines over the first 4 periods to add additional BA to the stand. The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to maintain the FWC's density target for longleaf forest.



SR04-1

SR04-2: This is a 17.2 -acre pre-merchantable planted longleaf pine stand that was established in 2004 and never thinned. The 2020 stand basal area (BA) was 20 ft^2 and there were, on average, 115 merchantable and 150 pre-merchantable longleaf pine trees per acre. There is no natural regeneration present as the stand is too young to produce seed in most situations.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years for all five periods (2020-2044).

The Sims 09 growth and yield model predicts that there will be sufficient volume in the longleaf plantation to thin it in the 3rd period (2035 – 2039). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 36ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2036 thin is approximately $8,513 or $3,537 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code) during the 5th time period (2040-2044).



SR04-2

SR04-3: This is a 6.7-acre pre-merchantable planted longleaf pine stand that was established in 2003 and never thinned. The 2020 stand basal area (BA) was 5 ft^2 and there were, on average, 37 merchantable and 50 pre-merchantable longleaf pine trees per acre. There is no natural regeneration present as the stand is too young to produce seed in most situations.

It is for that reason that it is recommended to burn and plant longleaf pine containerized seedlings at a rate of 300 trees per acre in the openings (BPO treatment code) as soon as possible (2020-2024). This will be the start of the future uneven-aged longleaf pine forest. The post plant burns should start no sooner than 2 years after planting and be cool enough to protect the newly planted trees until they begin to emerge from the grass stage. The stands should then be maintained (M treatment code) with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2025-2044). The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.

The Sims 09 growth and yield modeling software projects tree growth of the existing stand will not have enough volume to thin in 2044 and still leave an acceptable stocking level. The longleaf planted in the first period (2020-2024) combined with the 2004 planting may be approaching the density where thinning is a viable option by 2044. It is for that reason that the stand should be reevaluated (RE treatment code) in the 2040-2044 time period to determine if thinning would be appropriate in the future years.



SR04-3

SR05-1: This is a 151.6-acre merchantable planted slash pine stand that was established in 1975 and thinned heavily in 2004. The 2020 stand basal area (BA) was 16 ft^2 and there were, on average, 16 merchantable, 7 pre-merchantable, and 7/natural regeneration slash pine trees per acre.

It is for that reason that it is recommended to burn and plant longleaf pine containerized seedlings at a rate of 300 trees per acre in the openings (BPO treatment code) as soon as possible (2020-2024). This will be the start of the future uneven-aged mixed slash and longleaf pine forest. The post plant burns should start no sooner than 2 years after planting and be cool enough to protect the newly planted trees until they begin to emerge from the grass stage. The stands should then be maintained (M treatment code) with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2025-2044). The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.

The Sims 09 growth and yield modeling software projects that tree growth of the existing stand will not have enough volume to thin in 2026 when the stand is 50 years old. The Sims modeling is not appropriate after age 50 since the model did not have stands that age to develop the growth and yield equations.

The longleaf pines planted in the first period (2020-2024) combined with the 1975 planting may be approaching the density where thinning is a viable option by 2044. It is for that reason that the stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.



SR05-1, picture 1



SR05-1, picture 2

SR05-2: This is a 35.7-acre merchantable planted longleaf pine stand that was established in 2002 and is un-thinned. The 2020 stand basal area (BA) was 29ft^2 and there were, on average, 161 merchantable and 114 pre-merchantable longleaf pine trees per acre. No natural regeneration was found in the 2020 timber cruise.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years, depending on the understory regrowth (2020-2029).

The Sims 09 growth and yield modeling software projects sufficient volume to thin the stand in the 3rd period (2030-2034). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 37ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2031 thin is approximately $20,793.60 or $11,027 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code) during the 4th and 5th time period (2035-2044). Prescribed burns need to be timed to support natural regeneration. The longleaf cones take 2 years to develop, thus when the forest manager sees conelets beginning to develop on the longleaf trees, the manger should plan a burn to take place in September of the 2nd year, just before the seeds are released from the cones. Longleaf pine seed needs bare mineral soil to germinate. This strategy will provide the best chance for natural regeneration to occur. If the forest manager notices a robust germination of longleaf pine seed, the burns should resume no sooner than 2 years after germination and be cool enough to protect the naturally regenerated trees until they begin to emerge from the grass stage. While longleaf pines are protected by a fire tolerant apical bud, they are fragile and can be killed by a hot fire before they are well established.

The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to maintain the FWC's density target for longleaf forest.



SR05-2

24

SR06-1: This is a 147.3-acre pre-merchantable planted longleaf pine stand that was established in 2002 and un-thinned. The 2020 stand basal area (BA) was 14 ft^2 and there were, on average, 79 merchantable and 70 pre-merchantable/natural regeneration longleaf pine trees per acre. There were 3 natural regeneration seedlings present per acre.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years for the 1st through 5th periods (2020-2044).

The Sims 09 growth and yield model predicts that there will be sufficient volume in the longleaf plantation to thin it in the last year of the 5th period (2040 – 2044). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 33ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2044 thin is approximately $71,074.50 or $19,989 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle.



SR06-1

25

SR06-2: This is a 21-acre mature, planted slash pine stand that was established in 1983 and thinned heavily in 2004. The 2020 stand basal area (BA) was 34 ft^2 and there were, on average, 63 merchantable and 40 pre-merchantable slash pine trees per acre inventoried, with no natural regeneration. It is likely that the burn regime has been killing the natural slash pine regeneration as no pre-merchantable trees were inventoried in 2020. Slash pine is a fire intolerant species thus, this is not a surprise.

It is for that reason that it is recommended to burn and plant longleaf pine containerized seedlings at a rate of 300 trees per acre in the openings (BPO treatment code) as soon as possible (2020-2024). This will be the start of the future mixed longleaf and slash pine forest. The post plant burns should start no sooner than 2 years after planting and be cool enough to protect the newly planted trees until they begin to emerge from the grass stage. The stands should then be maintained (M treatment code) with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2025-2044). The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.

The Sims 09 growth and yield modeling software only projects tree growth to age 50 as older forest stands were not part of the model development; and the projections past tree age 50 are not valid. While the model would not project growth past tree age 50 for the existing stand, it is anticipated that longleaf trees planted in the 2020-2024 time period may provide sufficient volume, along with the current mature stand and any natural regeneration to warrant thinning in the future. It is for that reason that the stand should be reevaluated (RE treatment code) in the 2040-2044 time period to determine if thinning would be appropriate in the future years.



SR06-2

SR07-1: This is a 101.8-acre pre-merchantable planted longleaf pine stand that was established in 2004 and never thinned. The 2020 stand basal area (BA) was 14 ft^2 and there were, on average, 60 merchantable and 62 pre-merchantable longleaf pine trees per acre and 5 naturally regenerated longleaf pines per acre.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years for the 1st through 4th periods (2020-2039).

The Sims 09 growth and yield model predicts that there will be sufficient volume in the longleaf plantation to thin it in the last year of the 5th period (2040 – 2044). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 29ft^2 of BA remaining. This falls at the low end of the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2044 thin is approximately $64,392 or $18,109 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code).



SR07-1

SR07-2: This is a 42.4-acre merchantable planted longleaf pine stand that was established in 1992 and thinned in 2017 by removing the 5th row and selectively thinning the leave rows. The 2020 stand basal area (BA) was 46 ft^2 and there were, on average, 121 merchantable and 0 pre-merchantable longleaf pine trees per acre. 22 natural regeneration trees per acre were found in the 2020 timber cruise.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2020-2025). Prescribed burns need to be timed to support natural regeneration. The longleaf cones take 2 years to develop, thus when the forest manager sees conelets beginning to develop on the longleaf trees, the manger should plan a burn to take place in September of the 2nd year, just before the seeds are released from the cones. Longleaf pine seed needs bare mineral soil to germinate. This strategy will provide the best chance for natural regeneration to occur. If the forest manager notices a robust germination of longleaf pine seed, the burns should resume no sooner than 2 years after germination and be cool enough to protect the naturally regenerated trees until they begin to emerge from the grass stage. While longleaf pines are protected by a fire tolerant apical bud, they are fragile and can be killed by a hot fire before they are well established.

The Sims 09 growth and yield modeling software projects sufficient volume to thin the stand in the 2nd period (2025-2029). Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 35ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2028 thin is approximately $27,249 or $16,728 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code) during the 3rd through 5th time period (2030-2044).

The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to maintain the FWC's density target for longleaf forest.



SR07-2

29

SR08-1: This is a 75-acre merchantable planted longleaf pine stand that was established in 1977 and thinned heavily in 2004. The 2020 stand basal area (BA) was 18 ft^2 and there were, on average, 21 merchantable and 68 pre-merchantable longleaf pine trees per acre. There were 209 trees per acre on average of natural regeneration found in the 2020 timber cruise.

This stand is well on the way to becoming a naturally regenerated, multi aged forest. It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years, depending on the understory regrowth (2020-2044). Prescribed burns need to be timed to support natural regeneration. The longleaf cones take 2 years to develop, thus when the forest manager sees conelets beginning to develop on the longleaf trees, the manger should plan a burn to take place in September of the 2nd year, just before the seeds are released from the cones. Longleaf pine seed needs bare mineral soil to germinate. This strategy will provide the best chance for natural regeneration to occur. If the forest manager notices a robust germination of longleaf pine seed, the burns should resume no sooner than 2 years after germination and be cool enough to protect the naturally regenerated trees until they begin to emerge from the grass stage. While longleaf pines are protected by a fire tolerant apical bud, they are fragile and can be killed by a hot fire before they are well established.

The Sims 09 growth and yield modeling software projections are not useful in this situation as the modeling for the mature stand stops at age 50 due to software limitations. The stand has very good natural regeneration which should be contributing to the stand BA in the coming years. That is why the stand should be reevaluated (RE treatment code) in the 3rd period (2030-2034) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin in the 4th Period is warranted to maintain the FWC's density target for a longleaf forest. When the timber cruise data indicates there is approximately 70 ft^2 of BA, a thinning can be done. Half of the trees can then be removed, leaving about 35 ft^2 of BA, the low end of FWC's target BA. Typically, loggers will need to be able to harvest about 35 BA to make a cost-effective logging operation, thus the reason for the BA target of 70 before thinning.

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code).



SR08-1

31

SR08-2: This is a slender 23.9 acre planted longleaf pine stand that was established in 2005 and supplementally planted in 2008 due to drought. In addition, natural regeneration from adjacent stands has added additional age classes. The 2020 timber cruise indicated 114 pre-merchantable longleaf pine trees per acre, with 57 trees per acre of natural regeneration.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2020-2044).

The Sims 09 growth and yield modeling software is not reliable as an indicator of when to thin in a stand so young, thus it was not used.

The forest manager needs to monitor the progress of the stand growth to determine if the strategy of maintaining the stand with fire is the only treatment needed over time. If fire kills a lot of the trees planted or hardwood chokes out the young pines, a supplemental planting of longleaf pines may be needed, but it is too early to tell at this point.

The stand should be reevaluated (RE treatment code) in the 5th period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to maintain the FWC's density target for longleaf forest.



SR08-2 (in the foreground)

SR09-1: This is a 185.4-acre merchantable planted longleaf pine stand that was established in 1988 and thinned with every 5th row removed and the remaining rows were select thinned in 2018. The 2020 stand basal area (BA) was 28 ft^2 and there were, on average, 49 merchantable and 19 pre-merchantable longleaf pine trees per acre. There is no natural regeneration present.

It is for that reason that it is recommended to maintain (M treatment code) the stand with prescribed fire approximately every 3 years for the 1st through 4th periods (2020-2039). Prescribed burns need to be timed to support natural regeneration. The longleaf cones take 2 years to develop, thus when the forest manager sees conelets beginning to develop on the longleaf trees, the manger should plan a burn to take place in September of the 2nd year, just before the seeds are released from the cones. Longleaf pine seed needs bare mineral soil to germinate. This strategy will provide the best chance for natural regeneration to occur. If the forest manager notices a robust germination of longleaf pine seed, the burns should resume no sooner than 2 years after germination and be cool enough to protect the naturally regenerated trees until they begin to emerge from the grass stage. While longleaf pines are protected by a fire tolerant apical bud, they are fragile and can be killed by a hot fire before they are well established.

The Sims 09 growth and yield model predicts that there will be approximately 54 BA of longleaf pine in 2044, based on the current mature stand that exists today. There should be enough additional natural regeneration by that time to add enough BA growth to remove 35 BA of trees in a thin and have 35 BA of trees remaining. It is for that reason a thin in the 5th period (2040 – 2044) is scheduled. Thin (T treatment code) the stand by removing approximately half of the trees, leaving approximately 35ft^2 of BA remaining. This falls within the target basal area range that FWC desires and also results in enough open areas to be able to support longleaf pine seed catch and natural regeneration to create a multi-aged stand.

The estimated income from a 2044 thin is approximately $ 110,482.00 or $31,072 in today's dollars (net present value).

After thinning, wait to burn for at least a year to reduce stress on the trees, then resume the normal maintenance burn cycle (M treatment code).



SR09-1

34

SR09-2: This is a 29.8 acre mature, planted slash pine stand that was established in 1984 and thinned heavily in 2004. The 2020 stand basal area (BA) was 8 ft^2 and there were, on average, 18 merchantable slash pine trees per acre inventoried and 50 pre-merchantable trees per acre, with no natural regeneration. It is likely that the burn regime has been killing the natural slash pine regeneration as no pre-merchantable trees were inventoried in 2020. Slash pine is a fire intolerant species thus, this is not a surprise.

It is for that reason that it is recommended to burn and plant longleaf pine containerized seedlings at a rate of 300 trees per acre in the openings (BPO treatment code) as soon as possible (2020-2024). This will be the start of the future mixed longleaf and slash pine forest. The post plant burns should start no sooner than 2 years after planting and be cool enough to protect the newly planted trees until they begin to emerge from the grass stage. The stands should then be maintained (M treatment code) with prescribed fire approximately every 3 years thereafter, depending on the understory regrowth (2025-2044).

The Sims 09 growth and yield modeling software only projects tree growth to age 50 as older forest stands were not part of the model development; and the projections past tree age 50 are not valid. While the model would not project growth past tree age 50 for the existing stand, it is anticipated that longleaf trees planted in the 2020-2024 time period may provide sufficient volume, along with the current mature stand and any natural regeneration to warrant thinning in the future. It is for that reason that the stand should be reevaluated (RE treatment code) in the 5^{th} period (2040-2044) by installing 10 BAF prism inventory samples, including both pine and hardwood sampling, to determine if a thin is appropriate to reach the FWC's density target for longleaf pines.



SR09-2

VI. Conclusions

The Suwannee Ridge WEA is currently being managed very well. The Forest Management Plan, if implemented, should result in naturally regenerating upland pine communities, within a basal area range of 30-60 ft2 /acre, dominated by an overstory of Longleaf pine with an uneven age distribution. This will require an adaptive management approach in that actions are recommended; then measurements will be taken in the future to determine if the action have delivered the desired results. Those results will then drive the next steps in the forest management process.

Over the course of the next 25 years the FWC can expect to spend approximately $468,000 on prescribed burning, $2,000 on herbicide application, $32,000 on planting approximately 96,000 longleaf pine containerized tublings and $18,000 to reevaluate the timber stands; for a total cost of approximately $520,000 or $433/acre on average (Tables 4 and 5 in the addenda). Individual stand costs and income are found in the addenda as well.

Timber thinnings are expected to produce approximately $397,000 over the course of twenty-five years with a net present value of $134,000 when discounted at 5% per year (Table 6 in the Addenda).

Frequent prescribed burning and pine mortality make it difficult to predict future stand stocking. More specifically, there is no accurate way to determine now how much natural regeneration will occur/survive or the amount of newly planted longleaf that will survive to maturity. It is for that reason that it is recommended that many stands be reevaluated at some point during the next 25 years to once again determine the basal area per acre and to serve as a basis for future planning.

The forest plans for WEA's span 25 years. When it comes to herbicide brand recommendations and dosages, we recommend FWC contact their herbicide technical representative to obtain the most current recommendations in advance of applying herbicide. There are several factors to consider.

With patents expired on the most commonly applied herbicides used in a forest setting, there is a multitude of new products and formulations hitting the market. The best product for the price this year may not be the best value next year. Likewise, "aquatic compatible" versions are being developed that may be more appropriate for some sites.

Lastly, each site herbicide prescription should identify the plants targeted to eliminate versus the desirable ones you're wanting unharmed, e.g., like longleaf pines and wiregrass.

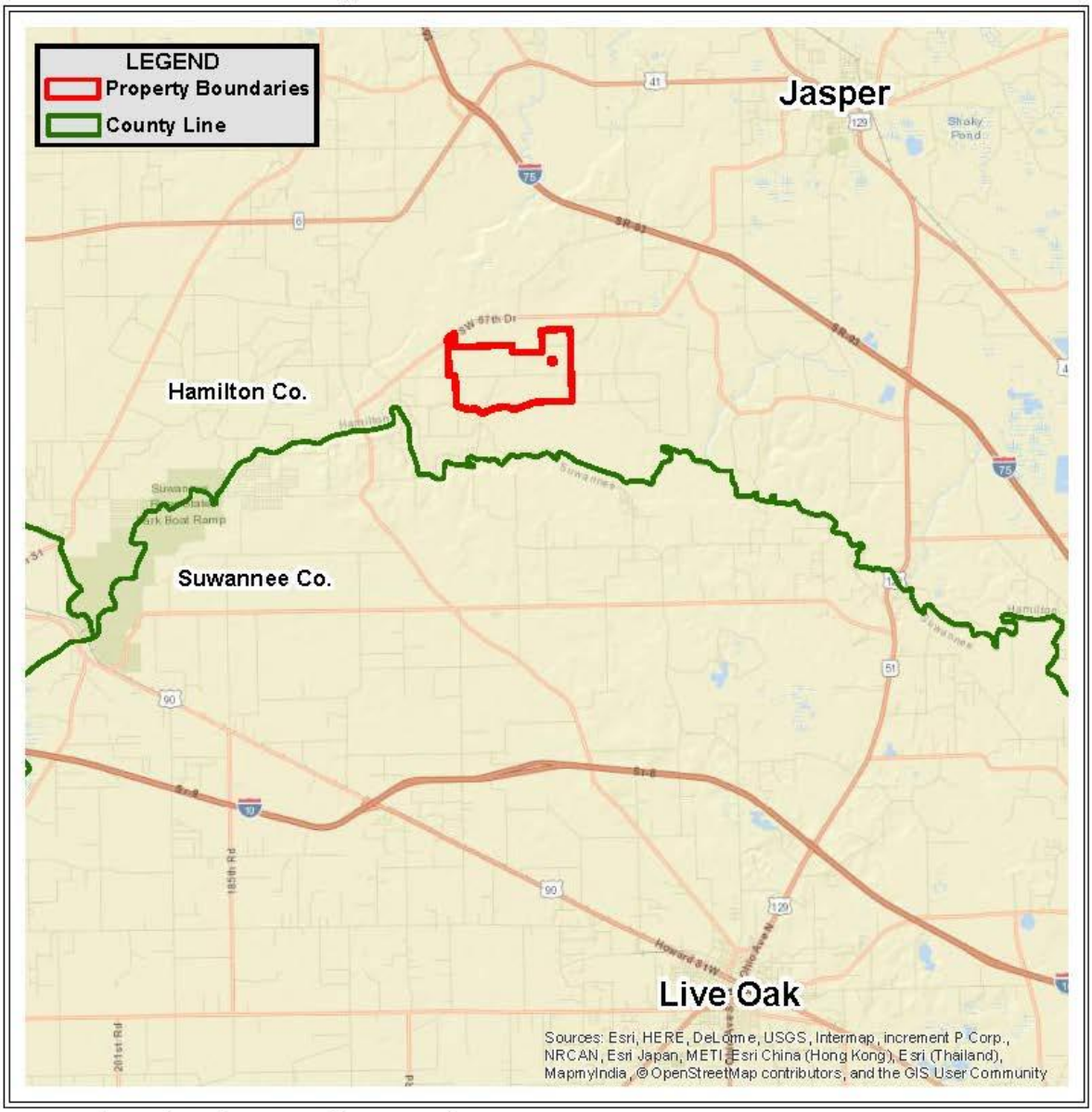
Additionally, the method of application must be considered. For instance, triclopyr may be best suited for "hack & squirt" (individual tree application), but may not be desirable for a broadcast application because of the species you wish to save. Timing of the application also depends on the herbicide being used (spring, summer, or fall).

At this time, we don't know who FWC will use as its licensed herbicide applicator, and how proficient they may be at mixing and applying the herbicides.

For the above reasons and legal liability that may be associated, The Forestry Company no longer publishes herbicide prescriptions – only that a herbicide may be needed to achieve FWC goals.

VII. MAPS

Suwannee Ridge WEA
Hamilton Co., FL
Total Tract GIS Acres - 1,438.1
Total Pine GIS Acres - 1,202.7



2 1 0 2 4
Miles

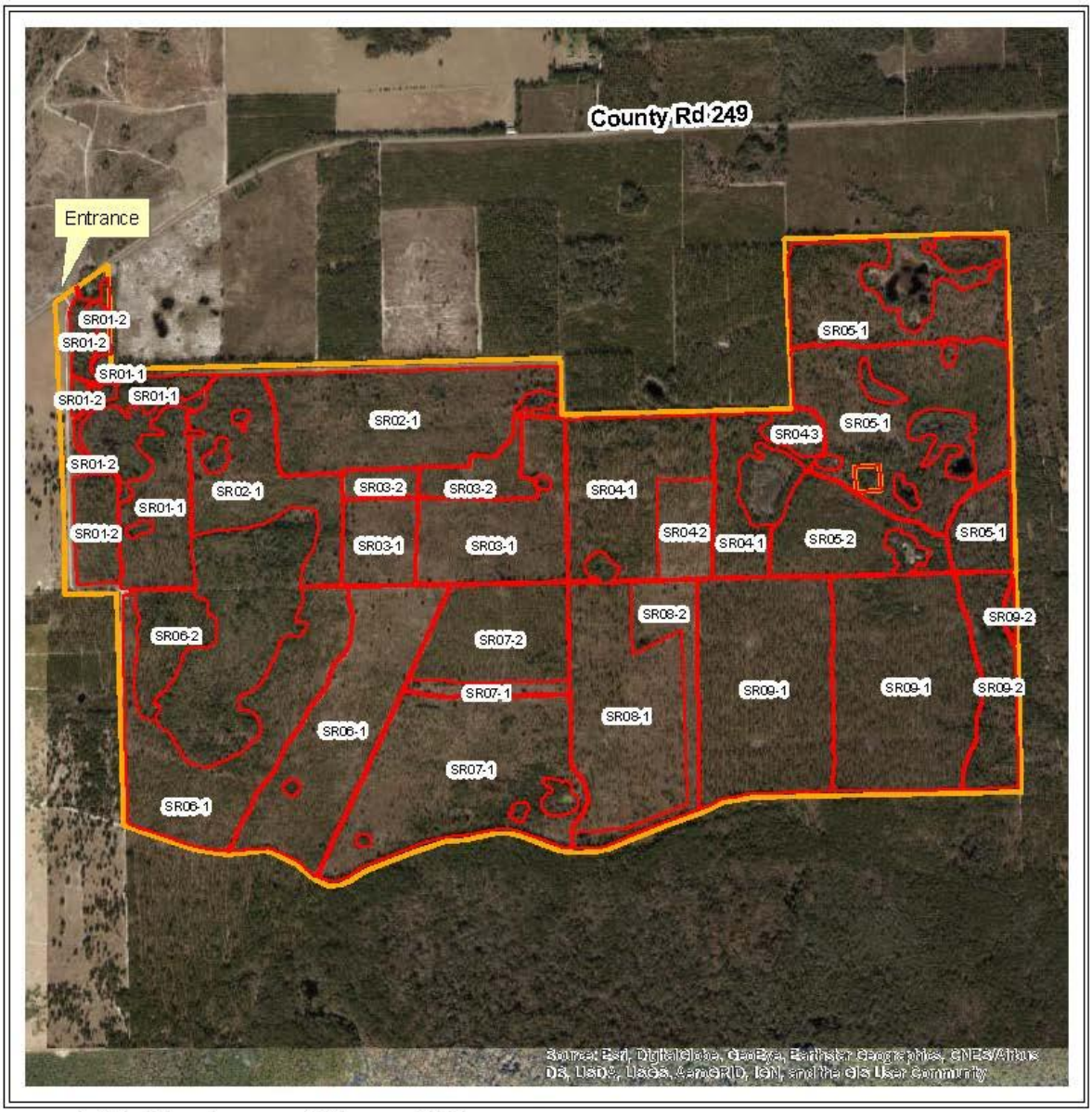
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PROJECTION: NAD 83, STATE PLANE, FLORIDA NORTH, FEET

NOTE: ACREAGE WAS DETERMINED ON THIS MAP THROUGH THE USE OF GLOBAL POSITIONING SYSTEMS (GPS) AND/OR GEOGRAPHIC INFORMATION SYSTEMS (GIS). THIS MAP IS NOT A SURVEY. THEREFORE, ACREAGE ON THIS MAP AND ANY SUBSEQUENT REPORT SHOULD BE VIEWED AS AN APPROXIMATION. FURTHERMORE, THE USE OF ANY OF THESE ACREAGES IN NEGOTIATIONS, SALES, OR CONTRACTUAL AGREEMENTS IS ENTIRELY AT THE RISK OF THE BUYER AND SELLER. REPRODUCTION OF OR EDITING OF THIS MAP IS FORBIDDEN WITHOUT EXPRESS WRITTEN PERMISSION OF THE FORESTRY COMPANY.

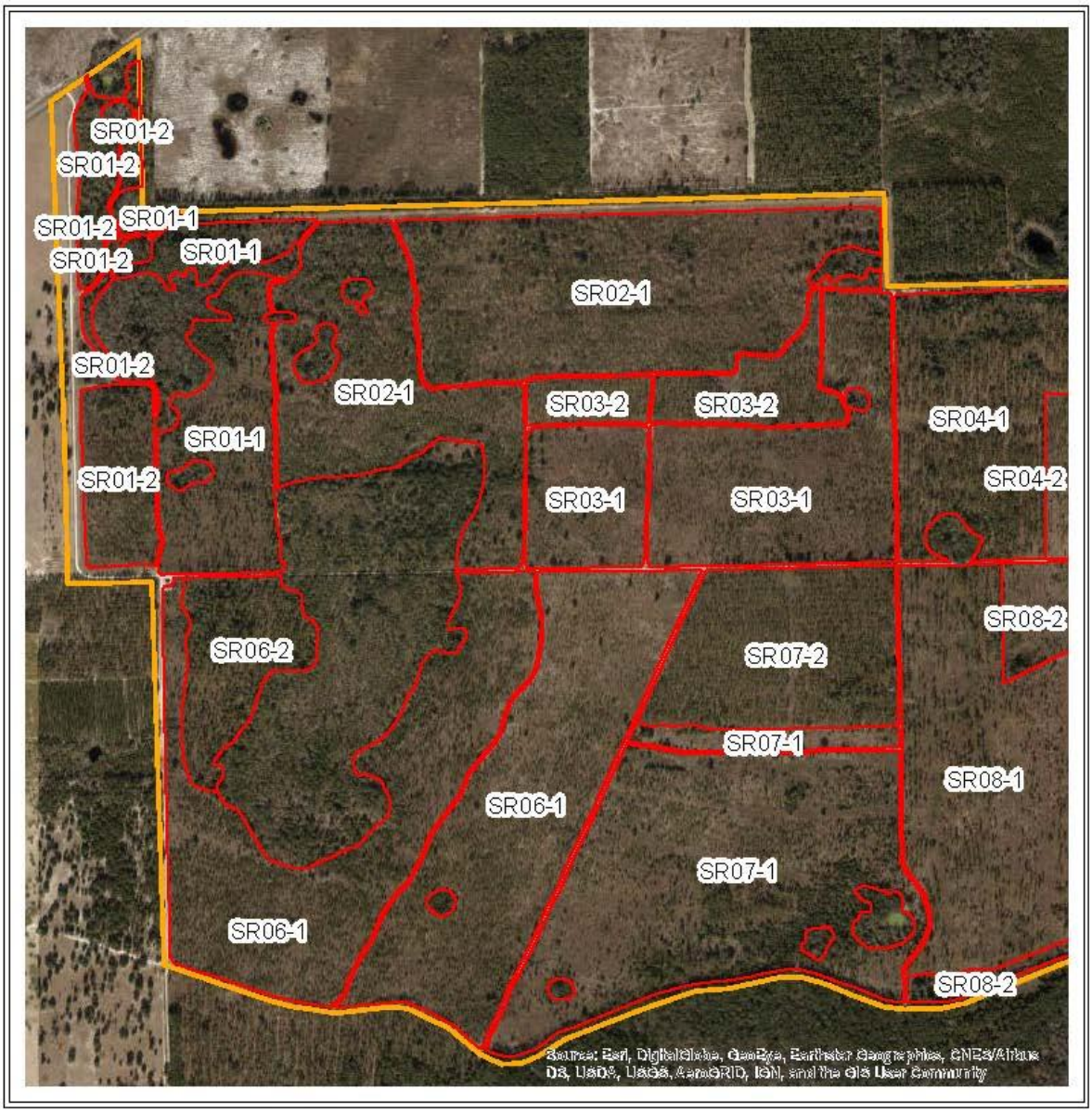
THE FORESTRY COMPANY
JOHN BOGUE
502 W. GREEN ST.
PERRY, FL. 32347
(850) 584 8887
4/05/18/21

Suwannee Ridge WEA
Hamiltont Co., FL
Total Pine GIS Acres - 1,202.7
Pine Stands Labeled by Stand Code



NOTE: ACREAGE WAS DETERMINED ON THIS MAP THROUGH THE USE OF GLOBAL POSITIONING SYSTEMS (GPS) AND/OR GEOGRAPHIC INFORMATION SYSTEMS (GIS). THIS MAP IS NOT A SURVEY. THEREFORE, ACREAGE ON THIS MAP AND ANY SUBSEQUENT REPORT SHOULD BE VIEWED AS AN APPROXIMATION. FURTHERMORE, THE USE OF ANY OF THESE ACREAGES IN NEGOTIATIONS, SALES, OR CONTRACTUAL AGREEMENTS IS ENTIRELY AT THE RISK OF THE BUYER AND SELLER. REPRODUCTION OF OR EDITING OF THIS MAP IS FORBIDDEN WITHOUT EXPRESS WRITTEN PERMISSION OF THE FORESTRY COMPANY.

Suwannee Ridge WEA
Hamiltont Co., FL
Total Pine GIS Acres - 1,202.7
Pine Stands Labeled by Stand Code



660 330 0 660 1,320
Feet

1:11,660

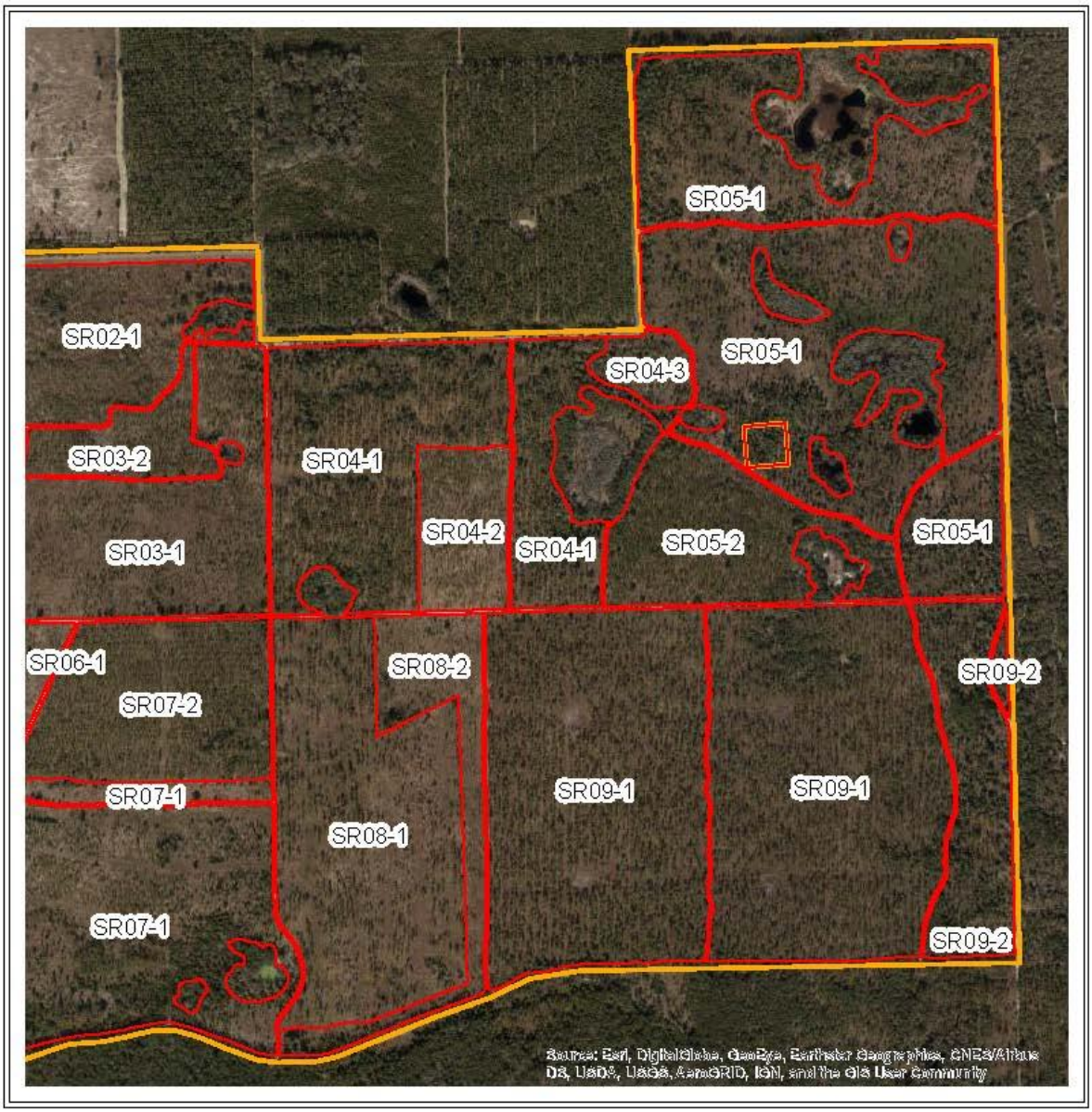
PROJECTION: NAD 83, STATE PLANE, FLORIDA NORTH, FEET

NOTE: ACREAGE WAS DETERMINED ON THIS MAP THROUGH THE USE OF GLOBAL POSITIONING SYSTEMS (GPS) AND/OR GEOGRAPHIC INFORMATION SYSTEMS (GIS). THIS MAP IS NOT A SURVEY. THEREFORE, ACREAGE ON THIS MAP AND ANY SUBSEQUENT REPORT SHOULD BE VIEWED AS AN APPROXIMATION. FURTHERMORE, THE USE OF ANY OF THESE ACREAGES IN NEGOTIATIONS, SALES, OR CONTRACTUAL AGREEMENTS IS ENTIRELY AT THE RISK OF THE BUYER AND SELLER. REPRODUCTION OF OR EDITING OF THIS MAP IS FORBIDDEN WITHOUT EXPRESS WRITTEN PERMISSION OF THE FORESTRY COMPANY.

LEGEND
Pine Stands
Property Boundaries

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4/25/18/21

Suwannee Ridge WEA
Hamiltont Co., FL
Total Pine GIS Acres - 1,202.7
Pine Stands Labeled by Stand Code



660 330 0 660 1,320
Feet

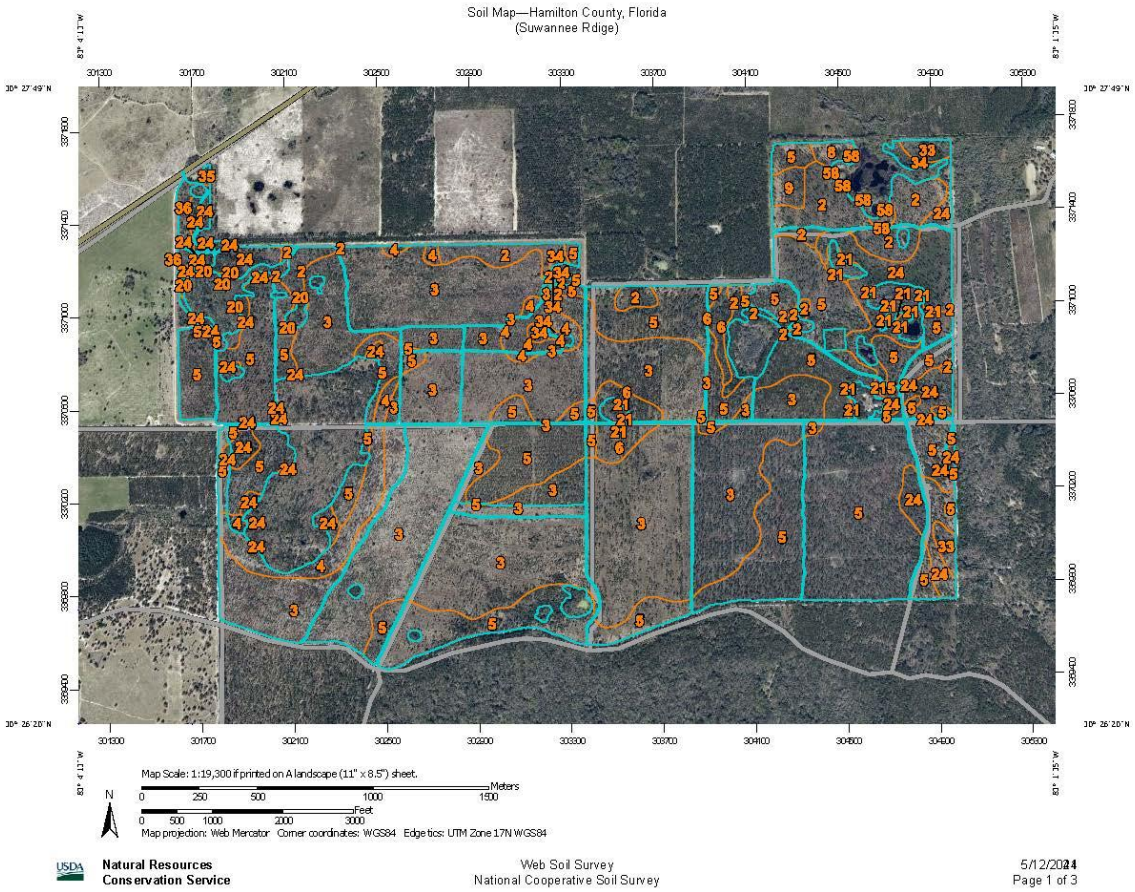
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PROJECTION: NAD 83, STATE PLANE, FLORIDA NORTH, FEET

NOTE: ACREAGE WAS DETERMINED ON THIS MAP THROUGH THE USE OF GLOBAL POSITIONING SYSTEMS (GPS) AND/OR GEOGRAPHIC INFORMATION SYSTEMS (GIS). THIS MAP IS NOT A SURVEY. THEREFORE, ACREAGE ON THIS MAP AND ANY SUBSEQUENT REPORT SHOULD BE VIEWED AS AN APPROXIMATION. FURTHERMORE, THE USE OF ANY OF THESE ACREAGES IN NEGOTIATIONS, SALES, OR CONTRACTUAL AGREEMENTS IS ENTIRELY AT THE RISK OF THE BUYER AND SELLER. REPRODUCTION OF OR EDITING OF THIS MAP IS FORBIDDEN WITHOUT EXPRESS WRITTEN PERMISSION OF THE FORESTRY COMPANY.

LEGEND
Pine Stands
Property Boundaries

THE FORESTRY COMPANY
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(850) 584 8887
4/05/18/21


Soil Map—Hamilton County, Florida
(Suwannee Ridge)
Map Scale: 1:19,300 if printed on A landscape (11" x 8.5") sheet.
Meters
Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84
Natural Resources
Conservation Service
Web Soil Survey
National Cooperative Soil Survey
5/12/2024
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hamilton County, Florida
Survey Area Data: Version 19, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 5, 2019—Mar 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Albany fine sand, 0 to 5 percent slopes	65.1	5.4%
3	Alpin sand, 0 to 5 percent slopes	528.9	44.0%
4	Alpin sand, 5 to 8 percent slopes	40.7	3.4%
5	Blanton sand, 0 to 5 percent slopes	420.8	35.0%
6	Blanton sand, 5 to 8 percent slopes	19.8	1.6%
8	Chipley sand, 0 to 5 percent slopes	3.6	0.3%
9	Foxworth sand, 0 to 5 percent slopes	5.5	0.5%
20	Pamlico muck, depressional	2.0	0.2%
21	Plummer and Surrency soils, depressional	3.1	0.3%
24	Ocilla loamy fine sand, 0 to 5 percent slopes	90.9	7.6%
33	Pelham sand	7.8	0.7%
34	Plummer sand	6.3	0.5%
35	Wahee fine sandy loam, 0 to 4 percent slopes, occasionally flooded	0.6	0.0%
36	Blanton fine sand, 0 to 5 percent slopes, occasionally flooded	5.4	0.4%
58	Sapelo sand	2.1	0.2%
Totals for Area of Interest		**1,202.8**	**100.0%**

VIII. ADENDA

Table 1

SUWANNEE RIDGE WEA STANDS LIST AND RECOMMENDATIONS																	
Stand Code	Acres	SI_Species	Nat/Planted Pine	Current: Even/Mix-aged	SI_BaseAge	SI	Age	ESTAB	ReproTPA	SubmerTPA	MerTPA	MerBA	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044
SR01-1	40.6	Slash Pine	Planted Pine	Mix-aged	50	60.9	39	1981	0	0	28.3	25.56	BPO	M	M	M	M & RE
SR01-2	28	Longleaf Pine	Planted Pine	Even-aged	50	47.5	17	2004	0	87.5	108.88	18.75	H &M	M	M	T & M	M
SR02-1	128.04	Longleaf Pine	Planted Pine	Even-aged	50	40.6	15	2005	0	100	78.07	12.76	M	M	M	M	T & M
SR03-1	69.01	Longleaf Pine	Planted Pine	Even-aged	50	48.7	16	2004	0	63.6	22.73	4.55	BPO	M	M	M	M & RE
SR03-2	20.3	Longleaf Pine	Planted Pine	Even-aged	50	57.2	31	1990	0	0	109.83	40	M	M	T & M	M	M & RE
SR04-1	78.9	Longleaf Pine	Planted Pine	Mix-aged	50	56.7	38	1982	156.3	18.8	44.38	30	M	M	M	M	M & RE
SR04-2	17.2	Longleaf Pine	Planted Pine	Even-aged	50	43.9	16	2004	0	150	114.57	20	M	M	M	T & M	M
SR04-3	6.7	Longleaf Pine	Planted Pine	Even-aged	50	51.7	17	2003	0	50	36.67	5	BPO	M	M	M	M & RE
SR05-1	151.6	Slash Pine	Planted Pine	Mix-aged	50	55.3	45	1975	6.7	6.7	15.86	16.33	BPO	M	M	M	M & RE
SR05-2	35.7	Longleaf Pine	Planted Pine	Even-aged	50	51	19	2002	0	114.3	161.49	28.57	M	M	T & M	M	M & RE
SR06-1	147.3	Longleaf Pine	Planted Pine	Even-aged	50	39	19	2002	3	69.7	79.15	13.94	M	M	M	M	T & M
SR06-2	21	Slash Pine	Planted Pine	Even-aged	50	60.7	37	1983	0	40	63.4	34	BPO	M	M	M	M & RE
SR07-1	101.8	Longleaf Pine	Planted Pine	Mix-aged	50	52.1	16	2004	4.8	61.9	60.45	14.29	M	M	M	M	T & M
SR07-2	42.4	Longleaf Pine	Planted Pine	Even-aged	50	58.3	28	1992	22.2	0	121.33	45.56	M	T & M	M	M	M & RE
SR08-1	75	Longleaf Pine	Planted Pine	Mix-aged	50	52.1	43	1977	209.1	68.2	21.25	17.73	M	M	M & RE	POSSIBLE T	M
SR08-2	23.9	Longleaf Pine	Planted Pine	Even-aged	50	0	0	2020	57.1	114.3	0	0	M	M	M	M	M & RE
SR09-1	185.4	Longleaf Pine	Planted Pine	Even-aged	50	58	32	1988	0	19.4	48.79	28.06	M	M	M	M	T & M
SR09-2	29.8	Slash Pine	Planted Pine	Even-aged	50	65.1	37	1984	0	50	17.66	8.33	BPO	M	M	M	M & RE

SI Species
Nat/Planted Primary pine species
Even/Mixed Natural or Planted Pine
SI Base Age Current 2020 stand condition
SI The year base that was used to determine Site Index
Age Site Index of the stand
ESTAB Current 2020 stand age
ReproTPA Year the stand was established
SubmerTPA Current 2020 Reproduction trees per acre, seedlings less than 4.5 ft tall
MerTPA Current 2020 Submerch trees per acre, saplings greater than 4.5 ft tall up to 4.5" DBH
Merch Trees per acre, trees 4.5" DBH and larger

The last 5 columns are the recommendation blocks in 5 year increments
BPO stands for Burn and Plant in the Open areas.
H stands for Herbicide
M stands for Maintain current forest conditions.
T stands for Thin stand to the desired basal area.
RE stands for Reevaluate.

Table 2

SUWANNEE RIDGE WEA SUMMARY TABLE OF RECOMMENDATIONS						
Stand Code	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Summary
SR01-1	BPO	M	M	M	M & RE	2020 - 2024 Burn and Plant in openings with longleaf containerized tublings at a rate of 300 stems per acre (SPA). Maintain - post plant burns should be cool enough to protect the newly planted trees. 2025 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR01-2	H &M	M	M	T & M	M	2020 - 2024 Apply herbicide to competing hardwood trees using spot spray or hack 'n squirt application methods. Wait until the hardwoods are dead before burning. Then burn approximately every 3 years. 2025-2034 Maintain the stand by use of prescribed burns approximately every 3 years. 2035 - 2039 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle. 2040-2044 Maintain the stand by use of prescribed burns approximately every 3 years.
SR02-1	M	M	M	M	T & M	2020 - 2039 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle.
SR03-1	BPO	M	M	M	M & RE	2020 - 2024 Burn and Plant in openings with longleaf containerized tublings at a rate of 300 stems per acre (SPA). Maintain - post plant burns should be cool enough to protect the newly planted trees. 2025 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR03-2	M	M	T & M	M	M & RE	2020 - 2039 Maintain the stand by use of prescribed burns approximately every 3 years. 2030-2034 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle. 2035-2044 Maintain the stand by use of prescribed burns approximately every 3 years. 2040 - 2044 Reevaluate by installing 10 BAF prism sample - include both pine and hardwood sampling.
SR04-1	M	M	M	M	M & RE	2020 - 2039 Maintain the stand by use of prescribed burns approximately every 3 years. 2040 - 2044 Reevaluate by installing 10 BAF prism sample - include both pine and hardwood sampling.
SR04-2	M	M	M	T & M	M	2020-2034 Maintain the stand by use of prescribed burns approximately every 3 years. 2035 - 2039 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle. 2040-2044 Maintain the stand by use of prescribed burns approximately every 3 years.
SR04-3	BPO	M	M	M	M & RE	2020 - 2024 Burn and Plant in openings with longleaf containerized tublings at a rate of 300 stems per acre (SPA). Maintain - post plant burns should be cool enough to protect the newly planted trees. 2025 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR05-1	BPO	M	M	M	M & RE	2020 - 2024 Burn and Plant in openings with longleaf containerized tublings at a rate of 300 stems per acre (SPA). Maintain - post plant burns should be cool enough to protect the newly planted trees. 2025 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR05-2	M	M	T & M	M	M & RE	2020 - 2029 Maintain the stand by use of prescribed burns approximately every 3 years. 2030-2034 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle. 2035-2044 Maintain the stand by use of prescribed burns approximately every 3 years. 2040 - 2044 Reevaluate by installing 10 BAF prism sample - include both pine and hardwood sampling.
SR06-1	M	M	M	M	T & M	2020 - 2039 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle.
SR06-2	BPO	M	M	M	M & RE	2020 - 2024 Burn and Plant in openings with longleaf containerized tublings at a rate of 300 stems per acre (SPA). Maintain - post plant burns should be cool enough to protect the newly planted trees. 2025 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR07-1	M	M	M	M	T & M	2020 - 2039 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle.
SR07-2	M	I & M	M	M	M & RE	2020-2024 Maintain the stand by use of prescribed burns approximately every 3 years. 2025 - 2029 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle. 2035-2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR08-1	M	M	M & RE	POSSIBLE T	M	2020-2029 Maintain the stand by use of prescribed burns approximately every 3 years. 2030 - 2034 Maintain the stand by use of prescribed burns approximately every 3 years. Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling to determine if a thin is needed. 2035-2039 Possibly thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle in 2040-2044
SR08-2	M	M	M	M	M & RE	2020 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.
SR09-1	M	M	M	M	T & M	2020 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. 2040-2044 Thin the stand by removing half of the trees. Wait to burn for at least a year after thinning to reduce stress on the trees, then resume the normal burn cycle.
SR09-2	BPO	M	M	M	M & RE	2020 - 2024 Burn and Plant in openings with longleaf containerized tublings at a rate of 300 stems per acre (SPA). Maintain - post plant burns should be cool enough to protect the newly planted trees. 2025 - 2044 Maintain the stand by use of prescribed burns approximately every 3 years. Years 2040 - 2044 Reevaluate by installing 10 BAF prism samples - include both pine and hardwood sampling.

Table 3		
TREATMENT RECOMMENDATIONS FOR RESTORING PINE FORESTS AT SUWANNEE RIDGE WEA		
Short Description	**Descriptive Map Treatment Code**	**Detailed Description**
Prescription for sites where there is an existing forest with large openings where there are no pines or where multiple age classes of pines do not exist.	**BPO**	**BPO-Burn, Plant in Openings:** Many stands in the WEA have pines in one part of the burn unit but openings where no pines or where multiple age classes of pines do not exist. These areas should be burned in the normal prescribed fire cycle which is bi-annual for Bell Ridge. The openings where no pines or where multiple age classes of pines do not exist should be hand-planted in the winter months (December-February) after the burn with containerized longleaf pine seedlings at 300 trees per acre in a non-uniform pattern. Prescribed burning should be temporarily suspended until the seedlings reach 3' in height. Since the burn frequency is more often than is used in plantation forests, mortality is expected to be greater, thus the reason for the planting density.
Prescription for maintain current forest conditions	**M**	**M - Maintain:** Maintain natural regeneration forest conditions through prescribed burning approximately every 3 years with a properly timed fire that is cool enough to protect the young pine regeneration as well as the mature trees in the forest. Longleaf pine cones take two years to mature and drop seed, therefore when mature Longleaf pine trees begin to grow male and female strobili, begin planning to control burn the stand under the pine the next year. The second year the cones grow to approximately 8" long in August or September. Plan to burn in early September to expose the mineral soil. The Seedfall usually occurs September-December. Germination can be robust.
Prescription for reevaluation	**RE**	**RE - Reevaluate:** Reevaluate the timber stand (inventory all pines and hardwoods) to determine if the stand needs thinning, additional planting or some other treatment to meet the FWC's overall objectives. A 10 BAF prism should be used for this inventory. Randomly located plots should be applied at a rate of one per 5 acres and not exceed 10 per stand during the appropriate time block. This information will help determine further management and/or be a starting point an updated management plan.
Prescription for site with longleaf pines and tall brush and/or dense oaks	**H**	**H-Herbicide:** Some sites have sufficient stocking of longleaf pine but may have heavy hardwood ingrowth. The hardwoods need to be removed such that the longleaf pine can have sufficient sunlight, water and nutrients to grow. This herbicide application of the hardwoods is considered a pine release. These sites are capable of supporting a future forest but the hardwoods are choking out the longleaf pines that exist. Depending on the height of the hardwoods and underbrush, utilize spot spraying or hack 'n squirt methods to apply herbicide to the hardwoods in mid to late summer.
Prescription for thin	**T**	**T-Thin:** This prescription is for stands that need to be thinned. Typically the stands will be thinned when they are approximately 70 BA and half of the trees / BA will be removed. Loggers need at leaset 35 BA to make it economically feasible to harvest and FWC wants a 30 to 60 BA remaining.

Table 4								
SUMMARY OF ESTIMATED MANAGEMENT COSTS FOR THE SUWANNEE RIDGE STANDS								
	Per Acre Cost	**2020-2024**	**2025-2029**	**2030-2034**	**2035-2039**	**2040-2044**	**Total Cost**	
Prescribed Burn	$50.00	-89,199.90	-97,507.20	-97,687.20	-97,318.20	-86,365.60	**-468,078.10**	
Herbicide- Tractor Treatment	$70.00	0.00	0.00	0.00	0.00	0.00	**0.00**	
Herbicide - Spot Spray	$70.00	-1,960.00	0.00	0.00	0.00	0.00	**-1,960.00**	
Herbicide - Hack 'n Squirt Treatment	$50.00	0.00	0.00	0.00	0.00	0.00	**0.00**	
Plant	$99.00	-31,572.09	0.00	0.00	0.00	0.00	**-31,572.09**	
Reevaluate	$0.00	0.00	0.00	-1,500.00	0.00	-16,500.00	**-18,000.00**	
TOTAL COST		**-122,731.99**	**-97,507.20**	**-99,187.20**	**-97,318.20**	**-102,865.60**	**-$519,610.19**	**-$432.05**
Thinning Income		**$0.00**	**$27,249.00**	**$36,281.90**	**$24,624.20**	**$309,308.00**	**$397,463.10**	**$330.49**
NET		-$122,731.99	-$70,258.20	-$62,905.30	-$72,694.00	$206,442.40	**-$122,147.09**	
							TIMBER INCOME NPV=	**$133,979.45**

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Table 5							
Suwanee Ridge WEA Estimated Costs for Tree Planting							
Stand	Acres	Estimated Plant Acres	# Tublings Needed - plant 300/ac	Tubling Cost $200/1000 tubling	Planting Cost ($0.13/Per Tubling)	Total Planting Cost	Per Acre
SR01-1	40.6	40.6	12,180	$2,436	$1,583.40	$4,019.40	$99.00
SR01-2	28	0.0	-	$0	$0.00	$0.00	$0.00
SR02-1	128.04	0.0	-	$0	$0.00	$0.00	$0.00
SR03-1	69.01	69.0	20,703	$4,141	$2,691.39	$6,831.99	$99.00
SR03-2	20.3	0.0	-	$0	$0.00	$0.00	$0.00
SR04-1	78.9	0.0	-	$0	$0.00	$0.00	$0.00
SR04-2	17.2	0.0	-	$0	$0.00	$0.00	$0.00
SR04-3	6.7	6.7	2,010	$402	$261.30	$663.30	$99.00
SR05-1	151.6	151.6	45,480	$9,096	$5,912.40	$15,008.40	$99.00
SR05-2	35.7	0.0	-	$0	$0.00	$0.00	$0.00
SR06-1	147.3	0.0	-	$0	$0.00	$0.00	$0.00
SR06-2	21	21.0	6,300	$1,260	$819.00	$2,079.00	$99.00
SR07-1	101.8	0.0	-	$0	$0.00	$0.00	$0.00
SR07-2	42.4	0.0	-	$0	$0.00	$0.00	$0.00
SR08-1	75	0.0	-	$0	$0.00	$0.00	$0.00
SR08-2	23.9	0.0	-	$0	$0.00	$0.00	$0.00
SR09-1	185.4	0.0	-	$0	$0.00	$0.00	$0.00
SR09-2	29.8	29.8	8,940	$1,788	$1,162.20	$2,950.20	$99.00
TOTAL	1202.65	318.7	95,613	$19,123	$12,429.69	$31,552.29	$99.00

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Table 6

SUWANNEE RIDGE WEA TIMBER SALE INCOME						
Stand Code	**Acres**	**2020-2024**	**2025-2029**	**2030-2034**	**2035-2039**	**2040-2044**
SR01-1	40.6	$0.00	$0.00	$0.00	$0.00	$0.00
SR01-2	28	$0.00	$0.00	$0.00	$16,111.20	$0.00
SR02-1	128.04	$0.00	$0.00	$0.00	$0.00	$63,360.00
SR03-1	69.01	$0.00	$0.00	$0.00	$0.00	$0.00
SR03-2	20.3	$0.00	$0.00	$15,488.90	$0.00	$0.00
SR04-1	78.9	$0.00	$0.00	$0.00	$0.00	$0.00
SR04-2	17.2	$0.00	$0.00	$0.00	$8,513.00	$0.00
SR04-3	6.7	$0.00	$0.00	$0.00	$0.00	$0.00
SR05-1	151.6	$0.00	$0.00	$0.00	$0.00	$0.00
SR05-2	35.7	$0.00	$0.00	$20,793.00	$0.00	$0.00
SR06-1	147.3	$0.00	$0.00	$0.00	$0.00	$71,074.00
SR06-2	21	$0.00	$0.00	$0.00	$0.00	$0.00
SR07-1	101.8	$0.00	$0.00	$0.00	$0.00	$64,392.00
SR07-2	42.4	$0.00	$27,249.00	$0.00	$0.00	$0.00
SR08-1	75	$0.00	$0.00	$0.00	$0.00	$0.00
SR08-2	23.9	$0.00	$0.00	$0.00	$0.00	$0.00
SR09-1	185.4	$0.00	$0.00	$0.00	$0.00	$110,482.00
SR09-2	29.8	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL	1202.65	$0.00	$27,249.00	$36,281.90	$24,624.20	$309,308.00
					Grand Total 2020-2044	**$397,463.10**

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SUWANNEE RIDGE PLAN IMPLEMENTATION COSTS

SR01-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-2,030.00	-2,030.00	-3,248.00	-3,248.00	-3,248.00	-3,248.00	-15,022.00	
	Herbicide- Tractor Treatment	-$105.00	-4,263.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	-$4,019.40	$0.00	$0.00	$0.00	$0.00	-4,019.40	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$6,049.40	-$3,248.00	-$3,248.00	-$3,248.00	-$4,748.00	**-$20,541.40**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
								NET	**-$20,541.40**	
									TIMBER INCOME NPV=	**$0.00**

SR01-2		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-1,400.00	-2,240.00	-2,240.00	-2,240.00	-1,400.00	-2,240.00	-10,360.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	-$1,960.00	$0.00	$0.00	$0.00	$0.00	-1,960.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Total Cost			-$4,200.00	-$2,240.00	-$2,240.00	-$1,400.00	-$2,240.00	**-$12,320.00**	
	Thinning Timber Income			$0.00	$0.00	$0.00	$16,111.20	$0.00	**$16,111.20**	
								NET	**$3,791.20**	
									TIMBER INCOME NPV=	**$6,694.54**

SR02-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-1,400.00	-10,243.20	-10,243.20	-10,243.20	-10,243.20	-6,402.00	-47,374.80	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Total Cost			-$10,243.20	-$10,243.20	-$10,243.20	-$10,243.20	-$6,402.00	**-$47,374.80**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$63,360.00	**$63,360.00**	
								NET	**$15,985.20**	
									TIMBER INCOME NPV=	**$18,710.38**

SR03-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost
	Prescribed Burn	-$50.00	-3,450.50	-3,450.50	-5,520.80	-5,520.80	-5,520.80	-5,520.80	-25,533.70
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Spot Spray	-$70.00	-4,830.70	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-3,450.50	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Plant	-$99.00	-6,831.99	-$6,831.99	$0.00	$0.00	$0.00	$0.00	-6,831.99
	Reevaluate	$0.00	-$1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00
	Total Cost			-$10,282.49	-$5,520.80	-$5,520.80	-$5,520.80	-$7,020.80	**-$33,865.69**
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**

								NET	-$33,865.69	
								TIMBER INCOME NPV=		$0.00

SR03-2		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-3,450.50	-1,624.00	-1,624.00	-1,624.00	-1,015.00	-5,520.80	-11,407.80	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-4,830.70	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-3,450.50	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-6,831.99	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-$1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$1,624.00	-$1,624.00	-$1,624.00	-$1,015.00	-$7,020.80	**-$12,907.80**	
	Thinning Income			$0.00	$0.00	$15,488.90	$0.00	$0.00	**$15,488.90**	
								NET	**$2,581.10**	
								TIMBER INCOME NPV=		$8,214.09

SR04-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-1,400.00	-6,312.00	-6,312.00	-6,312.00	-6,312.00	-6,312.00	-31,560.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$6,312.00	-$6,312.00	-$6,312.00	-$6,312.00	-$7,812.00	**-$33,060.00**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**	
								NET	**-$33,060.00**	
								TIMBER INCOME NPV=		$0.00

SR04-2		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-1,400.00	-1,376.00	-1,376.00	-1,376.00	-1,376.00	-1,376.00	-6,880.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Total Cost			-$1,376.00	-$1,376.00	-$1,376.00	-$1,376.00	-$1,376.00	**-$6,880.00**	
	Thinning Income			$0.00	$0.00	$0.00	$8,513.00	$0.00	**$8,513.00**	
								NET	**$1,633.00**	
								TIMBER INCOME NPV=		$3,537.00

SR04-3		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost
	Prescribed Burn	-$50.00	-1,400.00	-335.00	-536.00	-536.00	-536.00	-536.00	-2,479.00
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Plant	-$99.00	-4,019.40	-$663.30	$0.00	$0.00	$0.00	$0.00	-663.30
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00
	Total Cost			-$998.30	-$536.00	-$536.00	-$536.00	-$2,036.00	**-$4,642.30**

	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**	
								NET	**-$4,642.30**	
									TIMBER INCOME NPV=	**$0.00**
SR05-1		**Per Acre Cost**	**Stand Cost for 1 Treatment**	**2020-2024**	**2025-2029**	**2030-2034**	**2035-2039**	**2040-2044**	**Total Stand Cost**	
	Prescribed Burn	-$50.00	-1,400.00	-7,580.00	-12,128.00	-12,128.00	-12,128.00	-12,128.00	-56,092.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	-$15,008.40	$0.00	$0.00	$0.00	$0.00	-15,008.40	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$22,588.40	-$12,128.00	-$12,128.00	-$12,128.00	-$13,628.00	**-$72,600.40**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**	
								NET	**-$72,600.40**	
									TIMBER INCOME NPV=	**$0.00**
SR05-2		**Per Acre Cost**	**Stand Cost for 1 Treatment**	**2020-2024**	**2025-2029**	**2030-2034**	**2035-2039**	**2040-2044**	**Total Stand Cost**	
	Prescribed Burn	-$50.00	-3,450.50	-2,880.00	-2,880.00	-1,800.00	-2,880.00	-2,880.00	-13,320.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-4,830.70	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-3,450.50	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-6,831.99	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-$1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$2,880.00	-$2,880.00	-$1,800.00	-$2,880.00	-$4,380.00	**-$14,820.00**	
	Thinning Income			$0.00	$0.00	$20,793.00	$0.00	$0.00	**$20,793.00**	
								NET	**$5,973.00**	
									TIMBER INCOME NPV=	**$11,027.00**
SR06-1		**Per Acre Cost**	**Stand Cost for 1 Treatment**	**2020-2024**	**2025-2029**	**2030-2034**	**2035-2039**	**2040-2044**	**Total Stand Cost**	
	Prescribed Burn	-$50.00	-1,400.00	-10,243.20	-10,243.20	-10,243.20	-10,243.20	-6,402.00	-47,374.80	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Total Cost			-$10,243.20	-$10,243.20	-$10,243.20	-$10,243.20	-$6,402.00	**-$47,374.80**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$71,074.00	**$71,074.00**	
								NET	**$23,699.20**	
									TIMBER INCOME NPV=	**$19,989.00**
SR06-2		**Per Acre Cost**	**Stand Cost for 1 Treatment**	**2020-2024**	**2025-2029**	**2030-2034**	**2035-2039**	**2040-2044**	**Total Stand Cost**	
	Prescribed Burn	-$50.00	-3,450.50	-1,050.00	-1,680.00	-1,680.00	-1,680.00	-1,680.00	-7,770.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-4,830.70	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-3,450.50	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-6,831.99	-$2,079.00	$0.00	$0.00	$0.00	$0.00	-2,079.00	
	Reevaluate	$0.00	-$1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$3,129.00	-$1,680.00	-$1,680.00	-$1,680.00	-$3,180.00	**-$11,349.00**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**	

								NET	-$11,349.00
								TIMBER INCOME NPV=	$0.00

SR07-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost
	Prescribed Burn	-$50.00	-1,400.00	-8,144.00	-8,144.00	-8,144.00	-8,144.00	-5,090.00	-37,666.00
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Total Cost			-$8,144.00	-$8,144.00	-$8,144.00	-$8,144.00	-$5,090.00	**-$37,666.00**
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$64,392.00	**$64,392.00**
								NET	**$26,726.00**
								TIMBER INCOME NPV=	$18,109.00

SR07-2		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost
	Prescribed Burn	-$50.00	-3,450.50	-3,360.00	-2,100.00	-3,360.00	-3,360.00	-3,360.00	-15,540.00
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Spot Spray	-$70.00	-4,830.70	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-3,450.50	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Plant	-$99.00	-6,831.99	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Reevaluate	$0.00	-$1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00
	Total Cost			-$3,360.00	-$2,100.00	-$3,360.00	-$3,360.00	-$4,860.00	**-$17,040.00**
	Thinning Income			$0.00	$27,249.00	$0.00	$0.00	$0.00	**$27,249.00**
								NET	**$10,209.00**
								TIMBER INCOME NPV=	$16,728.00

SR08-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost
	Prescribed Burn	-$50.00	-1,400.00	-6,000.00	-6,000.00	-6,000.00	-6,000.00	-6,000.00	-30,000.00
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	-$1,500.00	$0.00	$0.00	-1,500.00
	Total Cost			-$6,000.00	-$6,000.00	-$7,500.00	-$6,000.00	-$6,000.00	**-$31,500.00**
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**
								NET	**-$31,500.00**
								TIMBER INCOME NPV=	$0.00

SR08-2		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost
	Prescribed Burn	-$50.00	-1,400.00	-6,000.00	-6,000.00	-6,000.00	-6,000.00	-6,000.00	-30,000.00
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00
	Total Cost			-$6,000.00	-$6,000.00	-$6,000.00	-$6,000.00	-$7,500.00	**-$31,500.00**
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**

								NET	-$31,500.00	
								TIMBER INCOME NPV=		$0.00
SR09-1		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-1,400.00	-14,832.00	-14,832.00	-14,832.00	-14,832.00	-9,270.00	-68,598.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-2,842.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-2,030.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-4,019.40	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Reevaluate	$0.00	-1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Total Cost			-$14,832.00	-$14,832.00	-$14,832.00	-$14,832.00	-$9,270.00	**-$68,598.00**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$110,482.00	**$110,482.00**	
								NET	**$41,884.00**	
								TIMBER INCOME NPV=		$31,072.00
SR09-2		Per Acre Cost	Stand Cost for 1 Treatment	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	Total Stand Cost	
	Prescribed Burn	-$50.00	-3,450.50	-1,500.00	-2,400.00	-2,400.00	-2,400.00	-2,400.00	-11,100.00	
	Herbicide- Tractor Treatment	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Spot Spray	-$70.00	-4,830.70	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Herbicide - Hack 'n Squirt Treatment	-$50.00	-3,450.50	$0.00	$0.00	$0.00	$0.00	$0.00	0.00	
	Plant	-$99.00	-6,831.99	-$2,970.00	$0.00	$0.00	$0.00	$0.00	-2,970.00	
	Reevaluate	$0.00	-$1,500.00	$0.00	$0.00	$0.00	$0.00	-$1,500.00	-1,500.00	
	Total Cost			-$4,470.00	-$2,400.00	-$2,400.00	-$2,400.00	-$3,900.00	**-$15,570.00**	
	Thinning Income			$0.00	$0.00	$0.00	$0.00	$0.00	**$0.00**	
								NET	**-$15,570.00**	
								TIMBER INCOME NPV=		$0.00

Treatment Code Specifics

R - Regeneration: Regeneration sites are those with **natural regeneration and/or new plantings**. Those sites need cooler prescribed fire or mechanical treatments to reduce understory fuels prior to control burning so the young trees are not killed. The mechanical treatments might include harrowing fire lines around the pocket of regeneration or mowing/grinding around the pocket of regeneration; burning in the cooler months and/or burning with moist conditions to lessen the impact of the heat on the young pines.

The reproduction cycle and early growth characteristics vary depending on species of pine present. Therefore, it is important to consider the biology of the pine species when planning cultural activities to support natural regeneration.

Since longleaf pine is the current dominant pine species on Suwannee Ridge and is the target species for natural regeneration, information is provided regarding reporoduction and growth.

Longleaf Pine Reproduction and Growth Information[1] – Longleaf pine cones take two years to mature and drop seed, therefore when mature longleaf trees begin to grow male and female strobili, begin planning to control burn the stand under the longleaf the next year.



Longleaf Pine Strobili

The second year the cones grow from 1" long in February to 6"-8" long in May or June. Burn in early September to expose the mineral soil. The seedfall usually occurs September through December. Avoid control burning the new seedlings for the first year after they sprout and until the trees are 1/2' to 3' high as seedlings in those phases are more susceptible to being killed by fire.[2]

[1] Silvics of Forest Trees of the United States, Agriculture Handbook No. 271, 1965
[2] Silvics of Forest Trees of the United States. Agriculture Handbook No. 271, USDA 1965

If a prescribed fire is hot enough to kill mature pine trees, longleaf seedlings will not survive either. Cooler fires (until the longleaf seedlings are out of the grass stage and about 3' tall) are required to support a healthy longleaf forest restoration.

BPO-Burn, Plant in Openings: Many stands in the WEA have pines only in one part of the burn unit or multiple openings in sections of the unit where no or few pines exist. These stands should be burned in the normal prescribed fire cycle. Since longleaf is shade intolerant, the openings where no pines exist should be hand-planted in the winter months (November-February) after the burn with containerized longleaf seedlings at 300 trees per acre in a non-uniform pattern. Since the burn frequency is more often than is used in plantation forests, mortality is expected to be greater, thus the reason for the planting density. Longleaf should not be prescribed burned in the first year or when the trees are emerging from the grass stage up to 3' high. The proper herbicide will hold off the competing vegetation and will give the pines a chance to emerge above the competing vegetation.

M – Maintain: Maintaining the forest on Fort White WEA means continuing a bi-annual prescribed burning schedule on all Management Units targeted for longleaf restoration. Maintain new natural regeneration or new plantings (less than 3' tall) by mowing or control burning with a properly timed fire that is cool enough to protect the young pine regeneration as well as the mature trees in the forest. For natural regeneration, viable significant longleaf cone production usually occurs about once per decade. If heavy cone production is observed, then prescribed burning should be postponed until early September, as seedfall usually occurs September through December. Longleaf seed need bare mineral soil to germinate in large numbers. Suspend normal prescribed burning until new seedlings are out of the grass stage and 1/2' to 3' high, as seedlings in those phases are susceptible to being killed by fire.[3]

T- Thinning: Once the forest contains at least 70 square feet of basal area per acre of pine overstory, the site can be thinned by logging. Although, there are exceptions to this rule such as thinning damaged timber or thinning early to begin the process of maintaining certain stands, any less than 70 square feet of basal area will generally not yield enough wood to make it economically/ operationally feasible to thin the timber. The thinning should target to reduce basal area to around 30 square feet/acre.

H - Herbicide:Some stands may have too much hardwood ingrowth which chokes out pines due to shading and taking up nutrients and water needed for the pines. Spot spraying or hack 'n squirt application of herbicide is needed in those situations to create openings for the longleaf pines to thrive.

[3]Silvics of Forest Trees of the United States. Agriculture Handbook No. 271, USDA 1965

RE - Reevaluate: A 10 BAF prism should be used for this evaluation. Randomly located plots should be applied at a rate of one per 5 acres and not exceed 10 per stand. This information will help determine further management and/or be a starting point for another 25-year management plan.

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Herbicide Prescriptions

The forest plans for WEA's span 25 years. When it comes to herbicide brand recommendations and dosages, we recommend FWC contact their herbicide technical representative to obtain the most current recommendations in advance of applying herbicide as there are several factors to consider.

With patents expired on the most commonly applied herbicides used in a forest setting, there is a multitude of new products and formulations hitting the market. The best product for the price this year may not be the best value next year. Likewise, "aquatic compatible" versions are being developed that may be more appropriate for some sites.

Lastly, each site herbicide prescription should identify the plants targeted to eliminate versus the desirable ones you're wanting unharmed, e.g., like longleaf pines and wiregrass. Additionally, the method of application must be considered. For instance, triclopyr may be best suited for "hack & squirt" (individual tree application), but may not be desirable for a broadcast application because of the species you wish to save. Timing of the application also depends on the herbicide being used (spring, summer, or fall).

At this time, we don't know who FWC will use as its licensed herbicide applicator, and how proficient they may be at mixing and applying the herbicides.
For the above reasons and legal liability that may be associated, The Forestry Company no longer publishes herbicide prescriptions – only that a herbicide may be needed to achieve FWC goals.

Management of Prescribed Fire in Pine Forest Management

It is well understood that fire has a historical role in forests in Florida. The *Atlas of Florida's Natural Heritage – Biodiversity, Landscapes, Stewardship and Opportunities* Published by Florida Natural Areas Inventory (FNAI) states, "Before modern land uses fragmented natural ecosystems, fires frequently swept across Florida's landscape, keeping natural pine lands, marshes and prairies open and understory vegetation low and continually regenerating. Fire intensity was low, unlike the very damaging high intensity wildfires that sometime occur today."

A key statement from the FNAI clip is "fire intensity was low". Historically lightning fires struck and they burned day and night. The humidity typically rises at night and greatly slows fire so it can burn with low intensity, even in the growing season. Public safety issues now typically do not allow burning at night thus we lose the low intensity fire opportunity that was once available for our use as land managers. This requires one to consider many factors when deciding when to burn each individual burn unit versus just implementing a standard growing season burn regime to kill oaks or stimulate wire grass seed production. It's now important to evaluate each burn unit and decide what the burning objective is and tailor the burn to suit those purposes.

The key going forward is to customize each fire plan for each burn unit depending on the needs at the time. For example, if a burn block has some wire grass and FWC wants to support a good quality wire grass seed crop with the highest viability seed, burn in May or June, taking pre-burn treatment measures like mowing or chopping if there is a part of the block with heavy underbrush that would kill the pines if burned. Another example; If FWC notices a burn block that has longleaf pine growing, set in motion the preparations to burn the block the next year in September so the soil will be exposed and ready to accept the seed that will be released in October. These preparations may include chopping, mowing and/or spraying herbicide under the existing forest to reduce the fuel load before burning the next year.

Cruise Specifications (2020)

SAMPLING DESIGN

The Vendor must adhere to the following minimum forest inventory sample location and statistical precision standards:
The inventory will only use a systematic sample location cruising method. A description of the method of cruise should be included in the report. Natural Communities will be sampled on a 5 chain x 10 chain (one plot per five acres) sampling grid. Approximately 4,407 acres are to be inventoried across all five WEAs.
Sample location Size and Type – Merchantable pine timber will be sampled with 10 Basal Area factor (BAF) prism variable plot radius prism points. In addition to the variable radius (merchantable) sample location, a 1/100th acre nested sample plot location will be used to record pre-merchantable pine trees including regeneration seedlings. The BAF and fixed plot size shall remain the same throughout all stands during inventory services and not changed by the Vendor.

Statistical Precision – Vendor will report statistical confidence on the stand and management unit levels based on total tons and tons by product class. A statistical analysis of the total cruise by species and product class must be included and shall provide basal area and volume for all merchantable stands. The analysis summary shall, at a minimum, include total weight and volume (tons/cords/MFW) by product class with associated standard statistical metrics, including 80% confidence interval statistics with a 20% standard percent error.

FOREST INVENTORY TECHNICAL SPECIFICATIONS

1. *Tree Measurements* - All merchantable pine timber in all sample locations shall have the diameter at breast height (DBH) measured and tallied. DBHs shall be tallied in all pre-merchantable sample locations where tree height exceeds 4.5 feet. DBHs will be tallied in one (1) inch diameter classes (*e.g.*, 5" = 4.6" to 5.5"; 6" = 5.6" to 6.5", etc.). The minimum DBH for merchantable timber will be 5 inches (4.6" to 5.5"), and the DBH for pre-merchantable will be 1 inch to 4 inch diameter class trees (0.10" to 4.5"). Regeneration seedlings will be at least one foot high and less than 4.5 feet high (less than 0.1" DBH), including all grass stage longleaf pine seedlings.

Total heights will be tallied on all merchantable and pre-merchantable pine trees; tree heights will be measured and tallied in one (1) foot increments. Merchantable heights will be tallied to the nearest merchantable length based on product specifications outlined in this Request for Quotes (RFQ).
On each sample location, regeneration shall be counted and recorded using the nested 1/100th acre fixed radius (11.8 feet) plot. Every pine seedling shall be

counted in this circle that is at least one foot high and less than 4.5 feet high (less than 0.1" DBH), including all grass stage longleaf pine. For each species, the Vendor shall count any seedlings that occur within 11.8 feet (1/100th acre radius) of plot center and mark on the same tally as the tree tally. Use the "r" code or "0" in the DBH column, or leave DBH column blank to indicate regeneration seedlings. Only code species and tree count for seedlings. Seedling counts under 10 should be exact and counts over 10 can be estimated to save on time.

2. *Site Index Measurements* – On every 5th sample location, the first dominant or co-dominant pine tree to the right of the cruise line should be selected as the Site Index (SI) tree. Total height and age (based on boring) should be recorded along with species. Three years should be added to the boring age to account for height growth to DBH. If no merchantable trees are present on the 5th sample location, the next available sample location shall be selected as the SI sample location. Vendor shall make sure a minimum of two SI trees are measured in each pine stand having plots in them.

3. *Product Specifications* - The Vendor will identify and include in the report the DBH and height classes associated with each pine species product class based on the market in which the subject property is located. Depending on local markets, the Vendor shall designate product classes which may include, but is not limited to, the following: a. Pulpwood – Tally all trees in this product class that do not qualify for pine sawtimber or pine chip-n-saw. Pine topwood volume should be included as pine pulpwood in the cruise summary, but not used in the statistical analysis for pulpwood.

b. Chip-N-Saw – Tally all trees that are in this product class that are free of all defects such as cankers, excessive sweep or limbs, ring knots, forked, etc.

c. Sawtimber - Tally all trees that are in this product class that are free of all defects such as cankers, excessive sweep or limbs, ring knots, forked, etc. Specify percentage of total sawtimber that is in pole quality timber.

4. *Cruise Line and Sample location Marking* - Proper sample location and line identification is required for field check-cruise verification. All sample location centers will be marked and locations will be recorded with GPS unit with sub-meter precision. For each plot center, mark the center of the plot with a piece of flagging on the ground, along with a piece of flagging tied eye level with the knot facing plot center on a nearby branch or tree. For the flagging on the ground, partially bury one end of the flagging with a cruising staff of a stick leaving at least 12 inches of tape exposed above ground; the spot the flagging is buried will represent the actual plot center. On the eye level piece of flagging, write in permanent black marker the stand and plot #, cruiser's initials, and the date the plot was taken. The first tallied tree, generally the tree closest to

center of the plot, will be flagged with the knot facing plot center and the remaining tallied trees listed in clockwise order. If SI data is taken on that sample location, the cruiser will write "SI" on flagging and place the flagging on the bored tree.

5. *Tally Records and Cruise Maps* - Separate tally records for each tree must be maintained and numbered for each sample plot location. An accurate and detailed digital map, as well as GIS shapefile/feature class, must be provided identifying sample plot locations and plot numbers.

6. Inventory Field Check Specifications & Procedures a. Prior to payment to the Vendor, FWC staff will conduct two levels of data checks. The first will be a desk review of the Vendor's pine forest inventory data for any errors or omissions in the inventory or spatial data. If errors or omissions are present that data will be returned to the Vendor for correction or in serious cases re-cruising.

b. In addition to the desk review, FWC reserves the right to conduct a field "check cruise". A check cruise will consist of an on-site inspection of selected inventoried plots to verify that the Vendor has met FWC's required minimum field check specifications. The field check cruise will be conducted initially on a spot basis of the sample points visited during all phases of the inventory. Any plots taken in the field, may be checked by FWC. Using the same GIS plot locations from the initial sample, FWC staff will navigate to the original plot locations. During the field check, the plot will be tallied according to the contract specifications. Plot by plot comparisons can then be made at any time after the field check is completed according to the following. Check plot field measurements that deviate from the Vendor's field measurements by more than 5% may warrant additional check plots and corrective action by the Vendor. Critical attributes of the field work to be verified in a check plot include plot location and flagging, DBH and tree height measurements, stem counts of merchantable timber classes, and marking of site index trees.

7. *Stand and Stock Tables* – Stand, stock and volume tables and all conversion factors used in the report must conform to professional industry standards for the products and market in which the subject property is located and must be based on outside bark measurements The volume tables and all conversion factors used must be documented in the report. The report shall provide justification for the use of volume tables used and why it is applicable. Such justification may include information such as geographical region where the data was gathered, the species, and whether it was gathered from a plantation or natural stand. Reports will be compiled as follows: a. Merchantable Timber - Data for all merchantable timber must be summarized in stand and stock tables for each stand to include at least the following:

b. Pre-Merchantable Timber - Pre-merchantable regeneration reporting requirements shall minimally include:

1. Stems per acre by pine species and DBH class

2. Total number of stems
3. Volume per acre by pine species and DBH class
4. Total volume by pine species and DBH class
5. Volume by product class and pine species
6. Total basal area
7. Basal area by pine species
8. Age by pine species
9. Total and Merchantable Height
10. Five-year radial growth
1. Regeneration seedling stems per acre by pine species
2. Stems per acre by pine species and DBH class
3. Total Height

SIMS Growth and Yield

The following pages are SIMS 09 Stand Development Reports that have projected tree growth out to a maximum tree age of 50 years old (max age SIMS will project to). Thinning income projections are added to those reports. The year in which thinnings are planned are hi-lighted in yellow as well. Thinning is planned when the approximte BA is 70 ft2. This allows half of the trees to be removed, still leaving a stand within FWC's desired target for BA.

Stand Development Report: Stand Information
5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR01-1	Phys. Region	Lower CP
Acres	40.6	Estab. Date	1/1/1981
Soil Group	Non-Spodosol	Species : Model	Slash Pine:6002
Forest Type	PinePlt_merch	Site Index	61

Stand Development Report

Regime ID: Regime 1 FWC

Yield Unit: OB Green Tons

Year	Age	Thinning tatus	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
2020	39		79.0	28.0	26.0	13.0	25.5	1.6	12.3	2.6	9.0
2021	40		79.8	27.9	26.6	13.2	26.3	1.6	12.8	2.5	9.5
2022	41		80.7	27.7	27.1	13.4	27.1	1.6	13.2	2.3	10.0
2023	42		81.4	27.6	27.6	13.6	27.9	1.7	13.6	2.2	10.5
2024	43		82.2	27.4	28.1	13.7	28.6	1.7	14.0	2.1	11.0
2025	44		82.9	27.3	28.6	13.9	29.4	1.7	14.3	1.9	11.4
2026	45		83.6	27.2	29.1	14.0	30.1	1.7	14.7	1.8	11.9
2027	46		84.2	27.0	29.5	14.2	30.8	1.7	15.1	1.7	12.3
2028	47		84.8	26.9	29.9	14.3	31.4	1.7	15.4	1.5	12.8
2029	48		85.4	26.8	30.3	14.4	32.0	1.7	15.7	1.4	13.2
2030	49		86.0	26.6	30.7	14.5	32.6	1.7	16.1	1.3	13.6
2031	50		86.5	26.5	31.1	14.7	33.2	1.7	16.4	1.1	14.0

Tract Name: Suwannee Rdige Compartment: Stand Name: SR01-1

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5/6/2021

Stand Identification

Client Name:	FWC	State	Florida
Purchase Unit	Suwannee Ridge	County	Hamilton
Tract Name	Suwannee Ridge	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR01-2	Phys. Region	Lower CP
Acres	26.00 AC	Estab. Date	1/1/2004
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	48

Stand Development Report

Regime ID: Regime 1 FWC 15 15 26 30 **5/6/2021**

Yield Unit: OB Green Tons

Year	Year	Age	Thinning Status		Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield $16.00 Topwood	Pulpwood Yield $16.00 Pulpwood	Chip-N-Saw Yield $26.00 Chip-N-Saw	Sawtimber Yield $30.00 Sawtimber	Topwood	Pulpwood	Chip-N-Saw	Sawtimber	Total $ Harvested	TOTAL INCOME FOR 1/2 VOLUME THINNED	5% DISCOUNT RATE NPV OF TIMBER INCOME
																			$0.00	$6,694.54
	2020	16			36.0	169.0	15.0	5.7	9.6	0.3	8.5	0.4	0.0						$0.00	
	2021	17			37.7	169.0	22.6	6.2	12.1	0.5	10.6	0.9	0.0						$0.00	
	2022	18			39.4	168.8	26.3	6.7	14.8	0.9	12.5	1.7	0.0						$0.00	
	2023	19			41.0	168.7	30.0	7.1	17.3	1.4	13.1	2.9	0.0						$0.00	
	2024	20			42.5	168.6	30.6	7.6	20.2	1.9	13.8	4.3	0.0						$0.00	
	2025	21			43.9	168.5	31.6	8.0	23.1	2.4	14.6	6.1	0.0						$0.00	
	2026	22			45.3	168.4	41.2	8.3	26.0	3.0	15.1	8.0	0.0						$0.00	
	2027	23			46.6	168.3	44.6	9.7	29.0	3.4	15.9	9.9	0.1						$0.00	
	2028	24			47.9	168.2	46.3	9.0	32.1	3.9	16.1	11.9	0.2						$0.00	
	2029	25			48.9	168.1	91.7	9.4	35.1	4.2	16.7	13.7	0.5						$0.00	
	2030	26			50.0	167.9	95.0	9.7	38.0	4.5	17.4	15.2	0.9						$0.00	
	2031	27			51.1	167.8	50.2	9.9	40.9	4.9	18.5	16.3	1.6						$0.00	
	2032	28			52.0	167.6	51.3	10.2	43.9	5.1	19.4	16.9	2.5						$0.00	
	2033	29			53.0	167.5	84.3	10.5	46.7	5.4	20.6	17.0	3.8						$0.00	
	2034	30			53.9	167.3	97.1	10.7	49.5	5.8	21.5	16.5	5.3						$0.00	
	2035	31			54.7	167.2	68.8	10.9	52.2	6.1	23.3	16.7	7.1						$0.00	
	2036	32			55.5	167.0	72.4	11.1	54.8	6.5	24.5	14.5	9.1	$52.00	$136.40	$188.50	$130.50	$575.40	$16,111.20	assumes thinning half the volume
	2037	33			56.2	166.8	74.9	11.3	57.4	6.8	26.3	19.0	11.3							
	2038	34			56.8	166.6	77.5	11.5	59.9	7.2	27.8	11.5	13.4							
	2039	35			57.6	166.5	78.6	11.7	62.3	7.5	29.3	10.0	15.6							
	2040	36			58.2	166.3	81.8	11.9	64.6	7.8	30.7	8.5	17.7							
	2041	37			58.8	166.1	83.9	12.0	66.9	8.0	32.1	7.2	19.6							
	2042	38			59.3	165.9	86.6	12.2	69.0	8.2	33.4	5.9	21.5							
	2043	39			59.9	165.7	87.7	12.3	71.1	8.4	34.6	4.9	23.2							
	2044	40			60.3	165.5	89.5	12.5	73.1	8.5	35.5	3.9	24.8							
	2045	41			60.8	165.2	91.2	12.6	75.0	8.8	36.2	3.2	26.3							
	2046	42			61.3	165.0	90.6	12.7	76.8	8.7	36.0	2.5	27.7							
	2047	43			61.7	164.8	94.6	12.9	78.7	8.8	38.9	2.0	29.0							
	2048	44			62.1	164.6	96.1	13.0	80.4	8.8	39.9	1.6	30.1							
	2049	45			62.4	164.3	97.5	13.1	82.0	8.9	40.9	1.2	31.2							
	2050	46			62.8	164.1	98.9	13.2	83.6	8.9	41.6	0.9	32.2							
	2051	47			63.1	163.9	100.3	13.3	85.1	8.9	42.4	0.7	33.1							
	2052	48			63.4	163.6	101.5	13.4	86.5	8.9	43.2	0.5	34.0							
	2053	49			63.7	163.4	102.6	13.5	87.8	8.9	43.9	0.4	34.8							
	2054	50			64.0	163.1	103.9	13.6	89.3	8.9	44.6	0.3	35.6							

Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdge	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR02-1	Phys. Region	Lower CP
Acres	128	Estab. Date	6/28/2005
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	41

Stand Development Report

Regime ID: Regime 1 FWC 5/6/2021

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield	Prod2 Yield	Prod3 Yield	Topwood	Pulpwood	Chip-N-Saw	Sawtimber	Total $ Harvested	TOTAL INCOME FOR 1/2 VOLUME THINNED	5% discount rate NPV OF TIMBER INCOME
								$16.00 Pulpwood	$16.00 Pulpwood	$26.00 Chip-N-Saw	$30.00 Sawtimber					per acre		$18,710.38
								$16.00	$16.00	$26.00	$30.00							
2020	15		28.0	78.0	13.0	5.5	5.1											$0.00
2021	16		29.5	78.0	15.5	6.0	6.5	0.2	6.2	0.2	0.0							$0.00
2022	17		30.9	78.0	18.2	6.5	8.0	0.4	7.1	0.4	0.0							$0.00
2023	18		32.3	77.9	21.0	7.0	9.6	0.8	7.8	0.9	0.0							$0.00
2024	19		33.6	77.9	23.7	7.5	11.2	1.3	8.3	1.7	0.0							$0.00
2025	20		34.8	77.9	26.6	7.9	13.0	1.9	8.5	2.7	0.0							$0.00
2026	21		36.0	77.9	29.4	8.3	14.8	2.3	8.6	3.8	0.0							$0.00
2027	22		37.1	77.8	32.1	8.7	16.7	2.7	8.8	5.1	0.0							$0.00
2028	23		38.1	77.8	34.9	9.1	18.6	3.0	9.0	6.5	0.0							$0.00
2029	24		39.1	77.8	37.6	9.4	20.5	3.3	9.3	7.9	0.0							$0.00
2030	25		40.1	77.7	40.2	9.7	22.4	3.4	9.6	9.4	0.0							$0.00
2031	26		41.0	77.7	42.8	10.1	24.3	3.7	11.6	6.7	2.3							$0.00
2032	27		41.8	77.7	45.3	10.3	26.2	4.0	12.4	6.8	3.1							$0.00
2033	28		42.6	77.6	47.8	10.6	28.1	4.2	13.2	6.8	4.0							$0.00
2034	29		43.4	77.6	50.2	10.9	30.0	4.4	14.1	6.7	4.9							$0.00
2035	30		44.1	77.6	52.5	11.1	31.9	4.6	14.9	6.5	5.8							$0.00
2036	31		44.8	77.5	54.7	11.4	33.7	4.8	15.8	6.3	6.8							$0.00
2037	32		45.4	77.5	56.8	11.6	35.4	4.9	16.7	6.1	7.7							$0.00
2038	33		46.0	77.4	58.9	11.8	37.2	5.0	17.6	5.8	8.7							$0.00
2039	34		46.6	77.4	60.9	12.0	38.9	5.2	18.5	5.6	9.7							$0.00
2040	35		47.2	77.3	62.8	12.2	40.5	5.3	19.3	5.4	10.6							$0.00
2041	36		47.7	77.3	64.7	12.4	42.1	5.4	20.1	5.1	11.5							$0.00
2042	37		48.2	77.2	66.5	12.6	43.7	5.5	20.9	4.9	12.4							$0.00
2043	38		48.6	77.2	68.3	12.7	45.2	5.5	21.7	4.6	13.3							$0.00
2044	39	thin	49.0	77.1	69.9	12.9	46.7	5.6	22.5	4.4	14.2	$44.80 #	$180.00	$57.20	$213.00	$495.00	$63,360.00	thin 1/2 volume 5th per
2045	40		49.4	77.0	71.5	13.0	48.1	5.7	23.2	4.2	15.0							
2046	41		49.8	77.0	73.1	13.2	49.5	5.7	24.0	4.0	15.8							
2047	42		50.2	76.9	74.6	13.3	50.8	5.8	24.6	3.8	16.6							
2048	43		50.5	76.9	76.1	13.5	52.1	5.8	25.3	3.6	17.3							

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR03-1	Phys. Region	Lower CP
Acres	69	Estab. Date	1/1/2004
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	49

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
2020	15		35.0	23.0	5.0	6.3	2.5	0.2	2.0	0.3	0.0
2021	16		36.9	23.0	6.2	7.0	3.2	0.3	2.4	0.6	0.0
2022	17		38.7	23.0	7.5	7.7	4.1	0.4	2.7	0.9	0.0
2023	18		40.4	23.0	8.8	8.4	5.0	0.6	2.9	1.3	0.1
2024	19		42.0	23.0	10.1	9.0	5.9	0.8	3.1	1.8	0.2
2025	20		43.5	23.0	11.5	9.6	6.9	0.9	3.4	2.2	0.4
2026	21		45.0	23.0	12.8	10.1	8.0	1.1	3.7	2.4	0.7
2027	22		46.4	23.0	14.2	10.6	9.1	1.3	4.2	2.5	1.2
2028	23		47.7	23.0	15.5	11.1	10.1	1.4	4.7	2.3	1.7
2029	24		48.9	23.0	16.8	11.6	11.3	1.5	5.3	2.0	2.4
2030	25		50.1	23.0	18.1	12.0	12.4	1.7	5.9	1.6	3.2
2031	26		51.2	23.0	19.3	12.4	13.5	1.8	6.5	1.2	4.0
2032	27		52.3	23.0	20.5	12.8	14.5	1.9	7.1	0.8	4.8
2033	28		53.3	23.0	21.6	13.1	15.6	1.9	7.7	0.5	5.5
2034	29		54.2	23.0	22.8	13.5	16.7	1.9	8.3	0.3	6.2
2035	30		55.1	23.0	23.8	13.8	17.7	2.0	8.8	0.2	6.8

Tract Name: Suwannee Rdige Compartment: Stand Name: SR03-1 Page 1 of

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

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Yield Unit: OB Green Tons

Year	Thinning Age	Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
2036	31		56.0	23.0	24.8	14.1	18.7	2.0	9.3	0.1	7.3
2037	32		56.8	23.0	25.8	14.3	19.7	2.0	9.8	0.0	7.8
2038	33		57.6	23.0	26.8	14.6	20.7	2.0	10.3	0.0	8.4
2039	34		58.3	23.0	27.7	14.9	21.6	2.0	10.8	0.0	8.8
2040	35		59.0	23.0	28.6	15.1	22.5	2.0	11.3	0.0	9.3
2041	36		59.6	23.0	29.4	15.3	23.4	2.0	11.7	0.0	9.7
2042	37		60.2	23.0	30.2	15.5	24.2	2.0	12.1	0.0	10.2
2043	38		60.8	23.0	31.0	15.7	25.0	1.9	12.5	0.0	10.6
2044	39		61.3	23.0	31.7	15.9	25.8	1.9	12.9	0.0	11.0
2045	40		61.8	23.0	32.5	16.1	26.7	1.9	13.3	0.0	11.4
2046	41		62.3	23.0	33.1	16.2	27.4	1.9	13.7	0.2	11.7
2047	42		62.7	23.0	33.8	16.4	28.2	1.9	14.1	0.2	12.1
2048	43		63.2	23.0	34.4	16.6	28.9	1.9	14.4	0.1	12.4
2049	44		63.6	23.0	35.0	16.7	29.5	1.9	14.7	0.1	12.8
2050	45		63.9	23.0	35.6	16.8	30.2	1.9	15.1	0.1	13.1
2051	46		64.3	23.0	36.2	17.0	30.8	1.9	15.4	0.1	13.4
2052	47		64.6	23.0	36.7	17.1	31.4	1.9	15.7	0.0	13.8
2053	48		65.0	23.0	37.2	17.2	32.0	1.9	16.0	0.0	14.1
2054	49		65.3	23.0	37.7	17.3	32.6	1.9	16.3	0.0	14.3
2055	50		65.5	23.0	38.2	17.5	33.1	1.9	16.5	0.0	14.6

Tract Name: Suwannee Rdige Compartment: Stand Name: SR03-1 Page 2 of

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Ridge	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR03-02	Phys. Region	Lower CP
Acres	20.3	Estab. Date	1/1/1991
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	57

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield	Prod2 Yield	Prod3 Yield	Topwood	Pulpwood	Chip-N-Saw	Sawtimber	TOTAL INCOME FOR 1/2 VOLUME THINNED	NPV OF TIMBER INCOME
								$16.00 Pulpwood	$16.00 Pulpwood	$26.00 Chip-N-Saw	$30.00 Sawtimber					5% discount rate per acre	$8,214.09
								$16.00	$16.00 Pulpwood	$26.00 Chip-N-Saw	$30.00 Sawtimber						
																	$0.00
2020	29		65.0	110.0	40.0	8.2	36.1	2.5	21.7	9.8	2.2						$0.00
2021	30		66.1	109.9	43.3	8.5	39.7	2.9	22.9	10.9	3.0						$0.00
2022	31		67.1	109.8	46.5	8.8	43.2	3.3	24.0	12.1	3.8						$0.00
2023	32		68.1	109.8	49.6	9.1	46.8	3.6	25.1	13.1	4.7						$0.00
2024	33		69.0	109.7	52.7	9.4	50.0	4.0	26.2	14.0	5.8						$0.00
2025	34		69.8	109.6	55.6	9.6	53.3	4.3	27.4	14.7	6.9						$0.00
2026	35		70.6	109.5	58.5	9.9	56.7	4.6	28.5	15.3	8.3						$0.00
2027	36		71.4	109.4	61.3	10.1	59.9	4.9	29.7	15.6	9.6						$0.00
2028	37		72.1	109.3	64.0	10.4	63.0	5.2	30.9	15.8	11.1						$0.00
2029	38		72.8	109.2	66.6	10.6	66.0	5.5	32.1	15.9	12.6						$0.00
2030	39		73.5	109.1	69.0	10.8	69.0	5.7	33.3	15.8	14.2						$0.00
2031	40		74.1	109.0	71.4	11.0	71.9	5.9	34.5	15.6	15.8	$47.20	$276.00	$202.80	$237.00	$763.00	**$15,488.90** thin 1/2 volume 3rd period
2032	41		74.6	108.9	73.7	11.1	74.6	6.2	35.7	15.3	17.4						
2033	42		75.2	108.8	75.9	11.3	77.3	6.4	37.0	15.0	19.0						
2034	43		75.7	108.7	78.2	11.5	80.1	6.6	38.3	14.5	20.7						
2035	44		76.2	108.5	80.2	11.6	82.6	6.7	39.5	14.0	22.4						
2036	45		76.6	108.4	82.2	11.8	85.0	6.9	40.7	13.5	24.0						
2037	46		77.1	108.3	84.1	11.9	87.4	7.0	41.9	12.9	25.6						
2038	47		77.5	108.2	86.0	12.1	89.7	7.2	43.1	12.3	27.2						
2039	48		77.8	108.1	87.7	12.2	91.9	7.3	44.2	11.7	28.7						
2040	49		78.2	107.9	89.5	12.3	94.1	7.4	45.3	11.1	30.2						
2041	50		78.5	107.8	91.1	12.4	96.1	7.5	46.4	10.5	31.7						

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR04-1	Phys. Region	Lower CP
Acres	79	Estab. Date	1/1/1983
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	57

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Year	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield (Pulpwood)	Prod2 Yield (Chip-N-Saw)	Prod3 Yield (Sawtimber)	BA growth/yr
			2020										
37			2021	72.0	44.0	30.0	11.2	29.3	2.4	14.3	5.6	7.1	
38			2022	72.7	44.0	31.6	11.5	31.1	2.5	15.1	5.5	8.1	1.6
39			2023	73.3	44.0	33.2	11.8	32.9	2.7	15.8	5.3	9.1	1.6
40			2024	73.9	44.0	34.7	12.0	34.7	2.8	16.7	5.1	10.1	1.5
41			2025	74.5	44.0	36.2	12.3	36.4	2.9	17.5	4.8	11.2	1.5
42			2026	75.0	44.0	37.7	12.5	38.0	3.0	18.3	4.4	12.3	1.5
43			2027	75.6	44.0	39.1	12.8	39.7	3.1	19.2	4.0	13.4	1.4
44			2028	76.0	44.0	40.4	13.0	41.2	3.2	20.0	3.7	14.4	1.3
45			2029	76.5	44.0	41.8	13.2	42.8	3.2	20.8	3.3	15.5	1.4
46			2030	76.9	44.0	43.1	13.4	44.3	3.3	21.6	2.9	16.5	1.3
47			2031	77.3	44.0	44.3	13.6	45.8	3.4	22.5	2.6	17.5	1.2
48			2032	77.7	44.0	45.6	13.8	47.3	3.4	23.2	2.2	18.4	1.3
49			2033	78.1	44.0	46.7	14.0	48.6	3.4	24.0	1.9	19.3	1.1
50			2034	78.4	44.0	47.9	14.1	50.0	3.5	24.7	1.6	20.2	1.2
51			2035			49.1		51.0					1.0 growth assumed based on tree age
52			2036			50.1		52.0					1.0 growth assumed based on tree age
53			2037			51.1		53.0					1.0 growth assumed based on tree age
54			2038			52.1		54.0					1.0 growth assumed based on tree age
55			2039			53.1		55.0					1.0 growth assumed based on tree age
56			2040			54.1		56.0					1.0 growth assumed based on tree age
57			2041			55.1		57.0					1.0 growth assumed based on tree age
58			2042			56.1		58.0					1.0 growth assumed based on tree age
59			2043			57.1		59.0					1.0 growth assumed based on tree age
60			2044			58.1		60.0					1.0 growth assumed based on tree age

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwannee Ridge	County	Hamilton
Tract Name	Suwannee Ridge	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR04:2	Phys. Region	Lower CP
Acres	17	Estab. Date	1/1/2004
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	44

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons — 5% discount rate

Year	Age	Year	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	$16.00 Topwood		$15.00 Pulpwood	$26.00 Chip-N-Saw	$30.00 Sawtimber	Topwood		Pulpwood	Chip-N-Saw	Sawtimber	TOTAL INCOME FOR 1/2 VOLUME THINNED	NPV OF TIMBER INCOME
								$16.00 Topwood		$15.00 Pulpwood	$26.00 Chip-N-Saw	$30.00 Sawtimber						per acre	$3,537.58
																			$0.00
16		2020	32.0	115.0	20.0	5.6	9.0	0.2		8.7	0.2	0.0							$0.00
17		2021	33.6	114.9	23.5	6.1	11.1	0.4		10.3	0.5	0.0							$0.00
18		2022	35.0	114.7	27.0	6.6	13.3	0.7		11.6	1.0	0.0							$0.00
19		2023	36.4	114.6	30.5	7.0	15.7	1.2		12.7	1.8	0.0							$0.00
20		2024	37.8	114.4	34.1	7.4	18.1	1.8		13.4	2.9	0.0							$0.00
21		2025	39.0	114.3	37.6	7.8	20.6	2.4		13.9	4.4	0.0							$0.00
22		2026	40.2	114.1	41.1	8.1	23.1	3.0		14.2	6.0	0.0							$0.00
23		2027	41.4	113.9	44.5	8.5	25.7	3.5		14.5	7.8	0.0							$0.00
24		2028	42.5	113.7	47.9	8.8	28.3	3.9		14.8	9.6	0.0							$0.00
25		2029	43.5	113.5	51.1	9.1	30.9	4.3		15.1	11.6	0.0							$0.00
26		2030	44.5	113.3	54.3	9.4	33.5	4.5		15.5	13.5	0.0							$0.00
27		2031	45.4	113.1	57.3	9.6	36.0	4.7		15.9	15.4	0.0							$0.00
28		2032	46.3	112.9	60.3	9.9	38.6	4.9		16.6	16.9	0.2							$0.00
29		2033	47.1	112.6	63.2	10.1	41.0	5.1		17.3	18.3	0.4							$0.00
30		2034	47.9	112.4	65.9	10.4	43.5	5.2		18.1	19.2	0.9							$0.00
31		2035	48.6	112.1	68.6	10.6	45.8	5.5		18.1	19.5	1.7							$0.00
32		2036	49.3	111.9	71.1	10.8	48.1	5.8		20.3	19.0	3.0	$92.80	$0.00	$324.80	$494.00	$90.00	$500.80	$8,513.60
33		2037	50.0	111.6	73.5	11.0	50.4	6.2		21.7	17.7	4.8							
34		2038	50.6	111.3	75.9	11.2	52.6	6.7		23.1	15.8	7.0							
35		2039	51.2	111.0	78.1	11.4	54.7	6.8		26.1	9.9	12.1							
36		2040	51.7	110.7	80.2	11.5	56.8	6.8		27.1	9.6	13.3							
37		2041	52.2	110.4	82.2	11.7	58.7	6.9		28.1	9.4	14.4							
38		2042	52.7	110.1	84.3	11.8	60.7	7.0		29.0	9.1	15.5							
39		2043	53.2	109.8	86.1	12.0	62.5	7.1		29.9	8.8	16.6							
40		2044	53.6	109.5	87.9	12.1	64.3	7.2		30.8	8.5	17.7							
41		2045	54.1	109.2	89.7	12.3	66.0	7.3		31.7	8.3	18.7							
42		2046	54.4	108.8	91.3	12.4	67.6	7.4		32.5	8.0	19.7							

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR04-3	Phys. Region	Lower CP
Acres	6.7	Estab. Date	1/1/2003
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	52

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield (Pulpwood)	Prod2 Yield (Chip-N-Saw)	Prod3 Yield (Sawtimber)
17	2020		52.0	37.0	5.0	5.0	3.5	0.1	2.8	0.5	0.1
18	2021		54.3	37.0	6.7	5.8	5.0	0.2	3.8	0.8	0.2
19	2022		56.5	37.0	8.6	6.5	6.7	0.4	4.8	1.2	0.3
20	2023		58.5	37.0	10.6	7.2	8.7	0.5	5.8	1.7	0.6
21	2024		60.5	37.0	12.7	7.9	10.7	0.7	6.7	2.3	0.9
22	2025		62.4	37.0	14.8	8.6	12.8	1.0	7.5	2.9	1.4
23	2026		64.1	37.0	17.0	9.2	15.0	1.2	8.3	3.5	2.0
24	2027		65.8	37.0	19.1	9.7	17.3	1.4	9.1	4.0	2.8
25	2028		67.4	37.0	21.3	10.3	19.7	1.6	10.0	4.3	3.7
26	2029		68.9	37.0	23.4	10.8	22.0	1.9	10.9	4.5	4.7
27	2030		70.3	37.0	25.4	11.2	24.3	2.0	11.8	4.6	5.9
28	2031		71.7	37.0	27.4	11.7	26.6	2.2	12.8	4.5	7.1
29	2032		73.0	37.0	29.4	12.1	28.9	2.3	13.9	4.2	8.5
30	2033		74.2	37.0	31.2	12.4	31.2	2.5	15.0	3.9	9.8
31	2034		75.3	37.0	33.0	12.8	33.4	2.6	16.1	3.5	11.2
32	2035		76.4	37.0	34.7	13.1	35.6	2.7	17.3	3.1	12.6
33	2036		77.4	37.0	36.4	13.4	37.6	2.7	18.4	2.6	13.9
34	2037		78.4	37.0	37.9	13.7	39.7	2.8	19.4	2.2	15.2
35	2038		79.3	37.0	39.4	14.0	41.7	2.9	20.5	1.9	16.5
36	2039		80.2	37.0	40.9	14.2	43.6	2.9	21.5	1.5	17.6
37	2040		81.0	37.0	42.2	14.5	45.4	2.9	22.5	1.2	18.8
38	2041		81.7	37.0	43.5	14.7	47.2	3.0	23.4	1.0	19.8
39	2042		82.5	37.0	44.8	14.9	48.9	3.0	24.3	0.8	20.8
40	2043		83.1	37.0	46.0	15.1	50.6	3.0	25.2	0.6	21.8
41	2044		83.8	37.0	47.1	15.3	52.2	3.0	26.0	0.5	22.7
42	2045		84.4	37.0	48.2	15.5	53.7	3.0	26.8	0.3	23.6
43	2046		85.0	37.0	49.3	15.6	55.2	3.0	27.6	0.2	24.4
44	2047		85.5	37.0	50.2	15.8	56.6	3.0	28.3	0.2	25.1
45	2048		86.0	37.0	51.2	15.9	58.0	3.0	29.0	0.1	25.9
46	2049		86.5	37.0	52.1	16.1	59.3	3.0	29.6	0.1	26.5
47	2050		87.0	37.0	53.0	16.2	60.5	3.0	30.3	0.1	27.2
48	2051		87.4	37.0	53.8	16.3	61.8	3.0	30.9	0.0	27.8
49	2052		87.8	37.0	54.6	16.5	62.9	3.0	31.5	0.0	28.4
50	2053		88.2	37.0	55.4	16.6	64.0	3.0	32.0	0.0	29.0

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR05-1	Phys. Region	Lower CP
Acres	152	Estab. Date	1/1/1975
Soil Group	Non-Spodosol	Species : Model	Slash Pine:6002
Forest Type	PinePlt_merch	Site Index	55

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
2021	45		76.0	17.0	16.0	13.1	15.1	0.9	7.3	1.7	5.2
2022	46		76.6	16.9	16.3	13.3	15.5	0.9	7.5	1.6	5.5
2023	47		77.2	16.8	16.6	13.5	15.9	0.9	7.7	1.6	5.8
2024	48		77.7	16.7	16.9	13.6	16.3	0.9	7.9	1.5	6.0
2025	49		78.2	16.7	17.2	13.8	16.7	0.9	8.1	1.4	6.3
2026	50		78.7	16.6	17.4	13.9	17.0	1.0	8.3	1.3	6.5

Tract Name: Suwannee Rdige Compartment: Stand Name: SR05-1 Page 1 of 2

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR05-2	Phys. Region	Lower CP
Acres	36	Estab. Date	1/1/2002
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	51

Stand Development Report

Regime ID: Regime 1 FWC

5/6/2021

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield $16.00 Topwood $16.00	Prod1 Yield $16.00 Pulpwood $16.00	Prod2 Yield $26.00 Chip-N-Saw $26.00	Prod3 Yield $30.00 Sawtimber $30.00	Topwood	Pulpwood	Chip-N-Saw	Sawtimber	TOTAL INCOME per acre	5% discount rate NPV @ 5% $11,027.29
								Topwood	Pulpwood	Chip-N-Saw	Sawtimber						
18	2020		42.0	161.0	29.1	5.8	17.1	0.6	15.3	1.2	0.0						$ -
19	2021		43.7	160.6	33.4	6.2	20.6	0.9	17.5	2.1	0.0						$ -
20	2022		45.3	160.1	37.7	6.6	24.1	1.3	19.4	3.3	0.0						$ -
21	2023		46.8	159.7	42.2	7.0	27.8	1.8	21.0	4.9	0.0						$ -
22	2024		48.3	159.2	46.4	7.3	31.5	2.4	22.3	6.8	0.0						$ -
23	2025		49.6	158.7	50.6	7.6	35.2	2.9	23.4	8.9	0.0						$ -
24	2026		50.9	158.1	54.8	8.0	39.0	3.5	24.3	11.0	0.2						$ -
25	2027		52.2	157.6	58.7	8.3	42.7	4.0	25.1	13.3	0.3						$ -
26	2028		53.3	157.0	62.5	8.5	46.4	4.5	25.8	15.5	0.5						$ -
27	2029		54.4	156.4	66.2	8.8	50.0	5.0	26.6	17.6	0.9						$ -
28	2030		55.5	155.8	69.8	9.1	53.6	5.4	27.4	19.5	1.3						$ -
29	2031		56.5	155.1	73.2	9.3	57.1	5.8	28.2	21.2	2.0	$92.80	$451.20	$551.20	$60.00	$1,155.20	$20,793.60
30	2032		57.4	154.4	76.4	9.5	60.5	6.1	29.1	22.5	2.7						
31	2033		58.3	153.8	79.5	9.7	63.8	6.5	30.1	23.5	3.7						
32	2034		59.1	153.1	82.5	9.9	67.0	6.8	31.1	24.2	4.8						
33	2035		59.9	152.3	85.3	10.1	70.0	7.1	32.2	24.5	6.1						
34	2036		60.6	151.6	88.0	10.3	73.1	7.4	33.4	24.6	7.6						
35	2037		61.3	150.8	90.5	10.5	76.0	7.7	34.7	24.3	9.3						
36	2038		62.0	150.1	93.0	10.7	78.8	8.0	35.9	23.8	11.0						
37	2039		62.6	149.3	95.3	10.8	81.4	8.3	37.2	23.1	12.8						
38	2040		63.2	148.5	97.5	11.0	84.0	8.6	38.5	22.3	14.7						
39	2041		63.8	147.7	99.5	11.1	86.4	8.8	39.8	21.3	16.6						
40	2042		64.3	146.9	101.5	11.3	88.8	9.1	41.0	20.2	18.5						
41	2043		64.8	146.0	103.4	11.4	91.0	9.3	42.3	19.0	20.4						
42	2044		65.3	145.2	105.2	11.5	93.2	9.5	43.5	17.8	22.4						
43	2045		65.7	144.4	106.9	11.7	95.3	9.7	44.7	16.5	24.3						

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR06-1	Phys. Region	Lower CP
Acres	147	Estab. Date	1/1/2002
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	40

Stand Development Report

Regime ID: Regime 1 FWC

5% discount rate

TOTAL INCOME	NPV TIMBER
per acre	$19,989.04

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber	Topwood	Pulpwood	Chip-N-Saw	Sawtimber		
	18	2020	32.0	79.0	14.0	5.7	6.3	0.2	5.9	0.2	0.0	$16.00	$16.00	$26.00	$30.00		$ -
	19	2021	33.3	79.0	16.4	6.2	7.7	0.3	7.0	0.4	0.0						$ -
	20	2022	34.5	78.9	18.9	6.6	9.2	0.6	7.8	0.8	0.0						$ -
	21	2023	35.7	78.9	21.4	7.1	10.8	0.9	8.5	1.4	0.0						$ -
	22	2024	36.8	78.9	24.0	7.5	12.4	1.3	8.9	2.2	0.0						$ -
	23	2025	37.8	78.8	26.6	7.9	14.1	1.8	9.2	3.1	0.0						$ -
	24	2026	38.8	78.8	29.1	8.2	15.8	2.2	9.4	4.2	0.0						$ -
	25	2027	39.7	78.8	31.7	8.6	17.6	2.5	9.6	5.5	0.0						$ -
	26	2028	40.6	78.7	34.3	8.9	19.4	2.9	9.8	6.8	0.0						$ -
	27	2029	41.5	78.7	36.8	9.3	21.2	3.1	10.0	8.1	0.0						$ -
	28	2030	42.3	78.6	39.2	9.6	23.0	3.3	10.3	9.4	0.0						$ -
	29	2031	43.0	78.6	41.6	9.8	24.8	3.4	10.6	10.7	0.0						$ -
	30	2032	43.7	78.6	44.0	10.1	26.6	3.5	11.2	11.7	0.2						$ -
	31	2033	44.4	78.5	46.3	10.4	28.3	3.7	11.7	12.5	0.4						$ -
	32	2034	45.0	78.5	48.5	10.6	30.1	3.8	12.5	12.8	1.0						$ -
	33	2035	45.6	78.4	50.6	10.9	31.8	4.4	14.9	7.2	5.3						$ -
	34	2036	46.2	78.3	52.7	11.1	33.5	4.6	15.7	7.0	6.2						$ -
	35	2037	46.7	78.3	54.7	11.3	35.1	4.8	16.5	6.8	7.1						$ -
	36	2038	47.2	78.2	56.8	11.5	36.8	4.9	17.3	6.6	8.0						$ -
	37	2039	47.7	78.2	58.6	11.7	38.3	5.0	18.1	6.3	8.9						$ -
	38	2040	48.2	78.1	60.5	11.9	39.9	5.1	18.9	6.1	9.8						$ -
	39	2041	48.6	78.0	62.3	12.1	41.4	5.2	19.7	5.8	10.7						$ -
	40	2042	49.0	78.0	64.1	12.3	42.8	5.3	20.4	5.6	11.5						$ -
	41	2043	49.4	77.9	65.8	12.4	44.3	5.4	21.2	5.3	12.4						$ -
CME	42	2044	49.7	77.8	67.4	12.6	45.7	5.5	21.9	5.1	13.2	$88.00	$350.40	$132.60	$396.00	$483.50	$71,074.50
	43	2045	50.1	77.8	69.0	12.8	47.0	5.6	22.6	4.8	14.0						$ -
	44	2046	50.4	77.7	70.5	12.9	48.3	5.6	23.3	4.6	14.8						
	45	2047	50.7	77.6	72.0	13.0	49.6	5.7	24.0	4.4	15.6						
	46	2048	51.0	77.5	73.4	13.2	50.8	5.8	24.6	4.2	16.3						
	47	2049	51.3	77.5	74.8	13.3	52.0	5.8	25.2	4.0	17.0						
	48	2050	51.5	77.4	76.2	13.4	53.2	5.9	25.8	3.8	17.7						
	49	2051	51.7	77.3	77.5	13.6	54.3	5.9	26.4	3.6	18.4						
	50	2052	52.0	77.2	78.7	13.7	55.4	5.9	27.0	3.4	19.0						

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR06-2	Phys. Region	Lower CP
Acres	21	Estab. Date	1/1/1983
Soil Group	Unknown	Species : Model	Slash Pine:6002
Forest Type	PinePlt_merch	Site Index	61

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning tatus	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
2020	37		76.0	63.0	34.0	9.9	32.6	2.5	17.0	7.0	6.1
2021	38		76.9	62.7	34.9	10.1	33.8	2.6	17.5	7.1	6.6
2022	39		77.8	62.4	35.8	10.3	35.0	2.7	17.9	7.2	7.2
2023	40		78.6	62.1	36.7	10.4	36.2	2.8	18.4	7.3	7.7
2024	41		79.4	61.8	37.5	10.5	37.4	2.8	18.9	7.3	8.3
2025	42		80.2	61.4	38.3	10.7	38.5	2.9	19.4	7.4	8.9
2026	43		80.9	61.1	39.1	10.8	39.6	3.0	19.8	7.4	9.4
2027	44		81.6	60.8	39.8	10.9	40.7	3.0	20.2	7.4	10.0
2028	45		82.3	60.5	40.5	11.1	41.7	3.1	20.7	7.4	10.5
2029	46		82.9	60.2	41.2	11.2	42.7	3.2	21.1	7.4	11.0
2030	47		83.5	59.9	41.8	11.3	43.6	3.2	21.5	7.3	11.6
2031	48		84.1	59.6	42.4	11.4	44.6	3.3	21.9	7.3	12.1
2032	49		84.7	59.3	43.0	11.5	45.5	3.3	22.3	7.3	12.6
2033	50		85.2	59.0	43.6	11.6	46.4	3.3	22.7	7.2	13.1

Tract Name: Suwannee Rdige Compartment: Stand Name: SR06-2 Page 1

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwannee Ridge	County	Hamilton
Tract Name	Suwannee Ridge	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR07-1	Phys. Region	Lower CP
Acres	102	Estab. Date	1/1/2004
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	52

Stand Development Report

Regime ID: Regime 1 FWC

5% discount rate

TOTAL INCOME FOR 1/2 VOLUME THINNED	NPV OF TIMBER INCOME
per acre	$18,109.82

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre		BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield	Prod2 Yield	Prod3 Yield	Topwood	Pulpwood	Chip-N-Saw	Sawtimber	
										Pulpwood	Chip-N-Saw	Sawtimber	$16.00	$16.00	$26.00	$30.00	$0.00
16	2020		38.0	60.0		14.0	6.5	7.5	0.5	6.1	0.9	0.0					$0.00
17	2021		39.8	60.0		16.8	7.2	9.4	0.8	6.9	1.7	0.0					$0.00
18	2022		41.6	60.0		19.6	7.7	11.4	1.2	7.5	2.8	0.0					$0.00
19	2023		43.3	60.0		22.4	8.3	13.5	1.5	8.0	4.0	0.0					$0.00
20	2024		44.8	60.0		25.3	8.8	15.6	1.9	8.4	5.3	0.2					$0.00
21	2025		46.4	60.0		28.2	9.3	18.1	2.3	8.9	6.5	0.4					$0.00
22	2026		47.8	60.0		31.0	9.7	20.5	2.6	9.6	7.5	0.9					$0.00
23	2027		49.1	60.0		33.8	10.2	22.9	2.9	10.4	8.0	1.6					$0.00
24	2028		50.4	60.0		36.5	10.6	25.3	3.2	11.3	8.1	2.7					$0.00
25	2029		51.6	60.0		39.0	10.9	27.6	3.5	12.5	7.7	4.0					$0.00
26	2030		52.8	60.0		41.7	11.3	30.1	3.8	13.8	6.8	5.7					$0.00
27	2031		53.9	60.0		44.1	11.6	32.4	4.1	15.1	5.7	7.5					$0.00
28	2032		54.9	60.0		46.4	11.9	34.7	4.4	16.5	4.6	9.3					$0.00
29	2033		55.9	60.0		48.7	12.2	36.9	4.6	17.8	3.5	11.0					$0.00
30	2034		56.8	60.0		50.9	12.5	39.2	4.8	19.1	2.6	12.7					$0.00
31	2035		57.7	60.0		53.0	12.7	41.4	4.9	20.3	1.9	14.3					$0.00
32	2036		58.5	60.0		55.0	13.0	43.5	5.0	21.5	1.3	15.7					$0.00
33	2037		59.3	60.0		56.9	13.2	45.5	5.1	22.6	0.9	17.0					$0.00
34	2038		60.1	60.0		58.7	13.4	47.5	5.1	23.6	0.6	18.2					$0.00
35	2039		60.8	60.0		60.4	13.6	49.4	5.1	24.8	0.4	19.3					$0.00
36	2040		61.4	60.0		62.2	13.8	51.3	5.1	25.6	0.2	20.3					$0.00
37	2041		62.0	60.0		63.8	14.0	53.1	5.1	26.5	0.2	21.3					$0.00
38	2042		62.6	60.0		65.3	14.1	54.8	5.1	27.4	0.1	22.2					$0.00
39	2043		63.2	60.0		66.8	14.3	56.5	5.1	28.2	0.1	23.1					$0.00
40	2044		63.7	60.0		68.2	14.4	58.1	5.1	29.0	0.0	23.9	$81.60	$464.00	$0.00	$717.00	$631.30	$64,392.60
41	2045		64.2	60.0		69.6	14.6	59.6	5.1	29.8	0.0	24.7					
42	2046		64.7	60.0		70.8	14.7	61.1	5.1	30.6	0.0	25.5					
43	2047		65.1	60.0		72.1	14.8	62.7	4.8	31.0	1.8	25.1					
44	2048		65.5	60.0		73.3	15.0	64.1	4.8	31.7	1.7	25.9					

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Stand Development Report: Stand Information
5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Ridge	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR07-2	Phys. Region	Lower CP
Acres	42	Estab. Date	1/1/1992
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	58

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons 5% discount rate

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber	Topwood	Pulpwood	Chip-N-Saw	Sawtimber		TOTAL REVENUE per acre	NPV SP TIMBER $16,728.89
												$16.00	$16.00	$26.00	$30.00		$	-
	28	2020	58.0	121.0	46.0	8.3	37.1	8.1	21.6	11.1	1.3						$	-
	29	2021	59.0	120.8	49.3	8.7	40.4	3.5	22.5	12.6	1.8						$	-
	30	2022	60.0	120.6	52.6	8.9	43.7	3.9	23.4	13.9	2.5						$	-
	31	2023	60.9	120.3	55.8	9.2	47.0	4.3	24.3	15.1	3.2						$	-
	32	2024	61.8	120.1	58.8	9.5	50.1	4.6	25.2	16.1	4.1						$	-
	33	2025	62.6	119.9	61.8	9.7	53.2	5.0	26.2	16.9	5.2						$	-
	34	2026	63.4	119.6	64.6	10.0	56.2	5.3	27.2	17.4	6.3						$	-
	35	2027	64.2	119.4	67.3	10.2	59.2	5.6	28.3	17.7	7.6						$	-
	36	2028	64.8	119.1	70.1	10.4	62.1	5.9	29.4	17.8	9.0	$94.40	$470.40	$462.80	$270.00	$648.80	$27,249.60	
	37	2029	65.5	118.8	72.6	10.6	64.9	6.2	30.6	17.7	10.5							
	38	2030	66.1	118.5	75.0	10.8	67.6	6.4	31.7	17.4	12.1							
	39	2031	66.7	118.3	77.4	11.0	70.3	6.7	32.9	17.0	13.7							
	40	2032	67.3	118.0	79.6	11.1	72.8	6.9	34.1	16.4	15.3							
	41	2033	67.8	117.7	81.8	11.3	75.3	7.1	35.3	15.8	17.0							
	42	2034	68.3	117.4	83.8	11.4	77.6	7.3	36.5	15.0	18.7							
	43	2035	68.7	117.1	85.8	11.6	79.9	7.5	37.7	14.3	20.4							

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Stand Development Report: Stand Information
5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR08-1	Phys. Region	Lower CP
Acres	75	Estab. Date	1/1/1977
Soil Group	Non-Spodosol	Species : Model	Longleaf Pine:6007
Forest Type	PinePlt_merch	Site Index	52

Stand Development Report

Regime ID: Regime 1 FWC **5/6/2021**

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
2020	43		52.0	21.0	18.0	12.5	12.7	1.6	6.1	1.1	3.9
2021	44		52.3	21.0	18.7	12.8	13.3	1.7	6.5	0.8	4.3
2022	45		52.6	21.0	19.4	13.0	13.9	1.7	6.8	0.6	4.7
2023	46		52.9	21.0	20.1	13.2	14.4	1.8	7.1	0.4	5.1
2024	47		53.2	21.0	20.8	13.5	14.9	1.8	7.4	0.3	5.5
2025	48		53.5	21.0	21.4	13.7	15.5	1.8	7.7	0.2	5.8
2026	49		53.7	21.0	22.1	13.9	16.0	1.8	8.0	0.1	6.1
2027	50		54.0	21.0	22.7	14.1	16.5	1.8	8.2	0.0	6.4

Tract Name: Suwannee Rdige Compartment: Stand Name: SR08-1 Page 1

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Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC		State		Florida
Purchase Unit	Suwanne Ridge		County		Hamilton
Tract Name	Suwannee Ridge		Cover Type		Pine Stand
Compartment			Stand Origin		Planted
Stand Name	SR99-1		Phys. Region		Lower CP
Acres	105		Estab. Date		1/1/1998
Soil Group	Spodosol		Species / Model		Longleaf Pine:6007
Forest Type	PinePlt_merch		Site Index		59

Stand Development Report

Regime ID: Regime 1 FWC

5/6/2021

Year	Age	Year	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Yield Unit: OB Green Tons Total Yield		Topwood Yield	Prod1 Yield	Prod2 Yield	Prod3 Yield	Topwood $16.00	Pulpwood $16.00	Chip-N-Saw $26.00	Sawtimber $30.00		5% discount rate NPV_OF $91,072.04
	32	2030	58.0	48.0	28.0	10.3	22.3		2.4	10.7	5.9	3.3						$ -
	33	2031	58.8	48.0	29.6	10.7	24.0		2.6	11.4	6.0	4.1						$ -
	34	2032	59.5	48.0	31.5	11.0	25.6		2.7	12.1	5.9	5.0						$ -
	35	2033	60.2	48.0	33.3	11.3	27.3		2.8	12.9	5.6	6.0						$ -
	36	2034	60.9	48.0	35.0	11.6	29.0		3.1	13.7	5.2	7.0						$ -
	37	2035	61.5	48.0	36.6	11.9	30.6		3.2	14.5	4.8	8.1						$ -
	38	2036	62.0	48.0	38.2	12.1	32.2		3.3	15.3	4.2	9.2						$ -
	39	2037	62.6	48.0	39.8	12.3	33.7		3.6	16.2	3.7	10.3						$ -
	40	2038	63.1	48.0	41.3	12.6	35.2		3.6	17.0	3.2	11.4						$ -
	41	2039	63.6	48.0	42.7	12.8	36.7		3.7	17.8	2.7	12.5						$ -
	42	2040	64.1	48.0	44.2	13.0	38.1		3.8	18.6	2.2	13.5						$ -
	43	2041	64.5	48.0	45.5	13.2	39.5		3.8	19.4	1.8	14.5						$ -
	44	2042	64.9	48.0	46.9	13.4	40.9		3.9	20.2	1.4	15.4						$ -
	45	2043	65.3	48.0	48.2	13.6	42.3		3.9	20.9	1.1	16.3						$ -
	46	2044	65.7	48.0	49.5	13.7	43.6		4.0	21.6	0.8	17.1						$ -
	47	2045	66.0	48.0	50.7	13.9	44.8		4.0	22.3	0.6	17.9						$ -
	48	2046	66.3	48.0	51.9	14.1	46.1		4.0	22.9	0.5	18.6						$ -
	49	2047	66.6	48.0	53.0	14.2	47.3		4.0	23.6	0.3	19.3						$ -
	50	2038	66.9	48.0	54.2	14.4	48.4		4.0	24.2	0.2	20.0						$ -
	51	2039					49.4	forester estimate since tree age above 50	4.0	24.70	0.20	20.50						$ -
	52	2040					50.4	forester estimate since tree age above 51	4.0	25.20	0.20	21.00						$ -
	53	2041					51.4	forester estimate since tree age above 52	4.0	25.70	0.20	21.50						$ -
	54	2042					52.4	forester estimate since tree age above 53	4.0	26.20	0.20	22.00						$ -
	55	2043					53.4	forester estimate since tree age above 54	4.0	26.70	0.20	22.50						$ -
	56	2044					54.4	forester estimate since tree age above 55	4.0	27.20	0.20	23.00	$64.00	$435.20	$5.20	$690.00	$597.20	$1,10,482.00 There should be addition

84

Stand Development Report: Stand Information

5/6/2021

Stand Identification

Client Name	FWC	State	Florida
Purchase Unit	Suwanne Ridge	County	Hamilton
Tract Name	Suwannee Rdige	Cover Type	Pine Stand
Compartment		Stand Origin	Planted
Stand Name	SR09-2	Phys. Region	Lower CP
Acres	30	Estab. Date	1/1/1984
Soil Group	Non-Spodosol	Species : Model	Slash Pine:6002
Forest Type	PinePlt_merch	Site Index	65

Stand Development Report

Regime ID: Regime 1 FWC

Yield Unit: OB Green Tons

Year	Age	Thinning Status	Dom Ht (feet)	Trees/ Acre	BA/ Acre	QMD (inches)	Total Yield	Topwood Yield	Prod1 Yield Pulpwood	Prod2 Yield Chip-N-Saw	Prod3 Yield Sawtimber
	37		65.0	18.0	8.0	9.0	6.6	0.4	3.8	1.2	1.1
	38		65.8	17.9	8.3	9.2	7.0	0.5	3.9	1.3	1.2
	39		66.5	17.8	8.7	9.4	7.3	0.5	4.1	1.4	1.4
	40		67.2	17.7	9.0	9.6	7.6	0.5	4.2	1.4	1.5
	41		67.9	17.6	9.3	9.8	8.0	0.5	4.4	1.5	1.6
	42		68.6	17.6	9.6	10.0	8.3	0.6	4.5	1.5	1.7
	43		69.2	17.5	9.9	10.2	8.7	0.6	4.6	1.6	1.9
	44		69.8	17.4	10.2	10.4	9.0	0.6	4.7	1.6	2.0
	45		70.4	17.3	10.5	10.6	9.3	0.6	4.8	1.7	2.2
	46		70.9	17.2	10.8	10.7	9.6	0.7	4.9	1.7	2.3
	47		71.4	17.1	11.1	10.9	9.9	0.7	5.0	1.8	2.4
	48		71.9	17.0	11.3	11.0	10.2	0.7	5.1	1.8	2.6
	49		72.4	17.0	11.6	11.2	10.5	0.7	5.2	1.8	2.7
	50		72.9	16.9	11.8	11.3	10.8	0.8	5.3	1.9	2.9

85

ACTVITY COSTS - As of 2021

handplanting longleaf tublings
$ 0.13 per seedling

---

longleaf tublings
$ 200.00 per 1000 seedlings

---

spot spray herbicide
$70 per acre (includes herbicide and application costs) Imazapyr, triclopyr

---

tractor application and herbicide
$ 105.00 per acre (includes herbicide and application costs) Imazapyr, triclopyr

---

cost/type/rate HERB to use for hardwoods
$ 105.00 per acre (chemical and tractor costs). Imazapyr, triclopyr
$ 65.00 glyphosate per acre (chemical and tractor costs)

---

cost/type/rate HERB to use for palmetto/gallberry
$ 105.00 per acre (chemical and tractor costs). Imazapyr, triclopyr

---

chain saw hand crew
$ 600.00 per acre

---

heavy mowing (brown)
$ 85.00 per acre

---

mulching
$ 200.00 per acre

Burning
$ 50.00 per acre

Use "tractor application" rate for post WTC - example FW07-1

Use "Hack'n Squirt" for HBP without WTC - example FW03-1

ACRONYMIC KEY

Acronyms specific to the Lafayette Forest Management Plan

Florida Natural Areas Inventory (FNAI)
Management Unit (MU)
Specific number assigned to a pine stand (StandID)
Global Information System (GIS)
Growth and Yeild Software (SIMS)
Burn and plant in open areas (BPO)
Burn and plant (BP)
Herbicide, burn and plant in open areas (HBPO)
Herbicide burn and plant (HBP)
Maintain (M)
Protect natural regeration while burning (R)
Thin (T)
Reevaluate (RE)
Thin and Herbicide (TH)
Whole Tree Chipping (WTC)

Common Forestry Acronyms

ACRE (ac)
BASAL AREA (BA)
CHIP-n-SAW (CNS)
DIAMETER AT BREAST HEIGHT (DBH)
MERCHANTABLE HEIGHT (MHT)
NET PRESENT VALUE (NPV)
PULPWOOD (PW)
SAWLOG or SAWTIMBER (SAW)
SITE INDEX (SI)
BASAL AREA FACTOR (BAF)

11.16 Hydrologic Assessment and Conceptual Restoration Plan

Hydrologic Assessment and Conceptual Restoration Plan for the Suwannee Ridge Wildlife and Environmental Area

amec foster wheeler

March 2017



Hydrologic Assessment and Conceptual Restoration Plan for the Suwannee Ridge Wildlife and Environmental Area

Submitted to:
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
620 South Meridian Street
Tallahassee, FL 32399-1600

Submitted by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
404 SW 140th Terrace
Newberry, FL 32669

Charlene Stroehlen, PE
Senior Principal Engineer

Dustin Atwater, GISP
GIS Manager

Amec Foster Wheeler Project No.: 6063-16-0271
March 2017

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Table 2 Restoration Plan Cost Estimate

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1.0 Introduction

1.1 Purpose

Amec Foster Wheeler Environment & Infrastructure, Inc. was authorized by the Florida Fish and Wildlife Conservation Commission (FWC) under Contract Number FWC 15/16-026-21 to perform a hydrologic assessment and produce a conceptual restoration plan for the Suwannee Ridge Wildlife Environmental Area (WEA) located in Hamilton County, Florida.

The objective of this hydrologic assessment is to provide site-specific information regarding the historical drainage pathways, current drainage divide locations, current natural drainage pathways, existing man-made drainage structures, and to propose changes to existing site features in an effort to assist FWC personnel in maintaining the historic conditions of the Suwannee Ridge WEA.

1.2 Site Setting

The Suwannee Ridge WEA is located in southwestern Hamilton County with the site entrance at latitude 30°27'40.1"N, longitude 83°03'52.2"W off of County Road 249. The southern project boundary is approximately one mile from the Suwannee River and the site shares a boundary with the Holton Creek Conservation Area. The total area of the Suwannee Ridge WEA is approximately 1,428 acres. The location of the Suwannee Ridge WEA in reference to the surrounding region is illustrated in Figure 1. Site photographs are provided in Appendix A.

The Suwannee Ridge WEA was established in 2002 to conserve and restore natural wildlife habitat and provide recreational opportunities such as hunting, hiking, and environmental education (FWC, 2015). The project site also provides water quality benefits for the Suwannee River and is part of a larger chain of conservation areas along the river. The area supports a variety of ecologically sensitive natural communities including: depression marsh, mesic hammock, sandhill, sinkhole, upland hardwood forest, dome swamp, and wet flatwoods which are shown in Figure 5 (FWC, 2015).

1.3 Summary of Site Activities

In order to assess the historical and current drainage patterns and produce conceptual restoration plans, the following tasks were performed:

- Historical aerial photography from 1952 was downloaded and georeferenced.
- Historical and current drainage subbasins and patterns were assessed using the 1952 aerial photography and current Digital Elevation Model (DEM) (NAVD88).
- Amec Foster Wheeler personnel conducted an on-site survey to confirm the location and status of existing structures, define current flow directions (where possible), and determine restoration areas.
- Four populated shape files with metadata were produced for the Suwannee Ridge WEA:
  - Subbasin delineation
  - Natural drainage ways and flow directions
  - Existing water control structures
  - Conceptual restoration plan

2.0 Study Area Topography, Drainage and Subbasin Delineation

2.1 Topography

The topography of the Suwannee Ridge WEA is moderately rolling. Onsite elevations vary from approximately 50 feet (NAVD88) in low-lying depressions to 120 feet (NAVD88) in the northeast corner. The site is generally high in the northeast and low in the west and south with depressions and ridges throughout as shown in Figure 11.

2.2 Soil Characterization

Fifteen soil map units were identified within the Subject Property based on a review of the NRCS Soil Survey of Hamilton County, Florida and Figure 8. The soil types are briefly described below:

- ***Albany Fine Sand, 0 to 5 percent slopes, MU Symbol 2*** – Albany Fine Sand is somewhat poorly drained. Slopes range from 0 to 5 percent. This soil group represents approximately 5.8 percent of the site.
- ***Alpin Sand, 0 to 5 percent slopes, MU Symbol 3*** – Alpin Sand is excessively drained. Slopes range from 0 to 5 percent. This soil group represents approximately 38.2 percent of the site.
- ***Alpin Sand, 5 to 8 percent slopes, MU Symbol 4*** – Alpin Sand is excessively drained. Slopes range from 5 to 8 percent. This soil group represents approximately 3.1 percent of the site.
- ***Blanton Sand, 0 to 5 percent slopes, MU Symbol 5*** – Blanton Sand is moderately well drained. Slopes range from 0 to 5 percent. This soil group represents approximately 33.6 percent of the site.
- ***Blanton Sand, 5 to 8 percent slopes, MU Symbol 5*** – Blanton Sand is moderately well drained. Slopes range from 5 to 8 percent. This soil group represents approximately 1.5 percent of the site.
- ***Chipley Sand, 0 to 5 percent slopes, MU Symbol 8*** – Chipley Sand is somewhat poorly drained. Slopes range from 0 to 5 percent. This soil group represents approximately 0.3 percent of the site.
- ***Foxworth Sand, 0 to 5 percent slopes, MU Symbol 9*** – Foxworth Sand is moderately well drained. Slopes range from 0 to 5 percent. This soil group represents approximately 0.4 percent of the site.
- ***Pamlico Muck, depressional, MU Symbol 20*** – Pamlico Muck is very poorly drained. Slopes range from 0 to 1 percent. This soil group represents approximately 0.9 percent of the site.
- ***Plummer and Surrency Soils, depressional, MU Symbol 21*** – Plummer and Surrency Soil is very poorly drained. Slopes range from 0 to 2 percent. This soil group represents approximately 1.5 percent of the site.
- ***Ocilla Loamy Fine Sand, 0 to 5 percent slopes, MU Symbol 24*** – Ocilla Loamy Fine Sand is somewhat poorly drained. Slopes range from 0 to 5 percent. This soil group represents approximately 11.6 percent of the site.
- ***Pelham Sand, MU Symbol 33*** – Pelham Sand is poorly drained. Slopes range from 0 to 2 percent. This soil group represents approximately 0.6 percent of the site.
- ***Plummer Sand, MU Symbol 34*** – Plummer Sand is poorly drained. Slopes range from 0 to 2 percent. This soil group represents approximately 0.8 percent of the site.
- ***Wahee Fine Sandy Loam, 0 to 4 percent slopes, occasionally flooded, MU Symbol 35*** – Wahee Fine Sandy Loam is somewhat poorly drained. Slopes range from 0 to 4 percent. This soil group represents approximately 0.1 percent of the site.

- ***Blanton Fine Sand, 0 to 5 percent slopes, occasionally flooded, MU Symbol 36*** – Blanton Fine Sand is moderately well drained. Slopes range from 0 to 5 percent. This soil group represents approximately 0.6 percent of the site.
- ***Sapelo Sand, MU Symbol 58*** – Sapelo Sand is poorly drained. Slopes range from 0 to 2 percent. This soil group represents approximately 1.0 percent of the site.

Soils are classified into one of four hydrologic soil groups depending on their runoff potential. The four hydrologic soil groups are A through D, where Group A has the smallest runoff potential, and Group D has the highest runoff potential. The soils at the Suwannee Ridge WEA are reported as group A and A/D and are identified in Figure 9 (NRCS, 2017). Brief descriptions of the identified hydrologic soil groups are discussed below:

- **Group A** Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
- **Group B** Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
- **Group C** Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
- **Group D** Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.
- If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

2.3 Drainage

The project area lies in the Upper Suwannee River Basin just east of the Alapaha River Basin. The project site generally drains to the west and south and eventually drains to the Suwannee River. During large storm events, a significant amount of flow has entered and exited the project boundary in the northeast and northwest portions of the site. The onsite sinkholes may be environmentally sensitive due to the potential hydrological connections with the Floridan aquifer (FWC, 2015). An in-depth study of this phenomenon was done in a geologically similar area. The City of Tallahassee's wastewater treatment facility operated effluent sprayfields which through subsurface hydrological connections, dramatically increased nitrate levels in Wakulla Springs more than 10 miles away (Davis 2010). The Suwannee Ridge WEA sinkholes are approximately one mile away from the Suwannee River and are therefore most likely connected to the river as well as downstream watersheds.

2.4 Subbasin Delineation

A drainage basin is defined as a region or area bounded by drainage divide and occupied by a drainage system. Drainage basins tend to cover large areas and are typically controlled by topography. As a result of their size, basins are frequently divided into subbasins. The Suwannee Ridge WEA is approximately 1,428 acres and is located in the Upper Suwannee River Basin. Within the Suwannee Ridge WEA there are 9 subbasins ranging from 19 acres to 384 acres as shown in Table 1, as well as Figures 12 and 13. The total acreage reported in Table 1 is 1,430 acres which reflects the added acreage of the cemetery that is not part of the project site.

Table 1. Subbasin Acreage

Watershed Basin	Subbasin ID	Acreage
Upper Suwannee River Basin	1	19
	2	384
	3	63
	4	56
	5	251
	6	66
	7	127
	8	263
	9	201

Created by: GRG
Checked by: DLA

3.0 Drainage Patterns and Restoration Recommendations

FWC and Amec Foster Wheeler personnel mobilized to the site to perform the on-site survey in November 2016. During the survey, FWC and Amec Foster Wheeler personnel analyzed the drainage patterns onsite and identified three water control structures onsite. The current drainage pattern is dominated by infiltration, but the project area generally drains to the west and south as shown in Figure 13.

In the office, a historical aerial photograph (1952) was utilized to analyze historical drainage patterns, Figure 12. Land elevation, vegetation patterns, and other visual data were used to determine current subbasins and flow directions. Drainage flow lines are generalized and represent overall flow within each subbasin. They do not represent specific flow patterns. Most of the onsite roads were present in the earliest historic photography and few other significant hydrologic modifications have been made to the site. Therefore, the historic and current drainage subbasins and flow patterns are the same.

Utilizing the aforementioned data along with field verified information, Amec Foster Wheeler has developed a restoration plan for the Suwannee Ridge WEA, Figure 15. Typical details for the low water crossings and riprap buffers can be seen in Figure 15a. The restoration plan is detailed below:

- Restoration Plan – Estimated Total Cost $42,589, Table 2
  - Construct two low water crossings to resolve erosion issues in the northeast.
  - Install keyed-in riprap buffers to prevent erosion in sink areas.
  - Install rock on Confederate Road to improve access through low sandy area.

Table 2. Restoration Plan Cost Estimate

Description	Estimated Quantity	Unit	Unit Price*	Estimated Amount
Low Water Crossing	130	LF	$228	$29,640
Riprap Buffers	8	EA	$1,400	$11,200
Road Stabilization	33	CY	$53	$1,749
			Total Cost	**$42,589**

*Source: FDOT (2016), RSMeans (2016), and Contech (2015)
Created by: GRG
Checked by: DLA

It should be noted that the restoration plans are only conceptual and additional information such as survey specific data, hydrologic modeling, and engineering design calculations will need to be executed before commencement of the activities.

4.0 Conclusions

Historic planting of slash and sand pine and the associated roads created to manage the planting activities have altered the native conditions of the Suwannee Ridge WEA. FWC has worked to restore more historic conditions and while the roads remain, most are close to natural grade and are still used for access. The presence of the roads does not appear to significantly affect the onsite hydrology. The northeastern offsite ditch and culvert system has not been maintained and is no longer functional. In large storm events, a significant amount of flow enters the project site from the northeast, overtops East Road, and eventually drains back offsite north of the Eleven Ponds marsh area. This scenario has caused erosion issues for both East Road and Ridge Road. Amec Foster Wheeler recommends constructing two low water crossings to manage the flow seen in this area. Two areas near onsite sinkholes are prone to erosion. The northwestern unimproved road particularly sees significant flows in large storm events and has experienced some erosion. Installing keyed-in riprap buffers will slow velocities and stabilize the existing grade. There are also erosion concerns for a ditch north of Main Road in the center of the site that leads to a sinkhole where a riprap buffer could be placed as well. Finally, there is a low point on Confederate Road east of the cemetery that is difficult to cross in both dry and wet conditions. Amec Foster Wheeler recommends installing rock through this area to stabilize the road and improve access. These measures will help prevent future erosion and assist FWC personnel with the management of the project site.

5.0 References

Davis, J.H., Katz, B.G., and Griffin, D.W., 2010, Nitrate-N movement in groundwater from the land application of treated municipal wastewater and other sources in the Wakulla Springs springshed, Leon and Wakulla Counties, Florida, 1966-2018: U.S. Geological Survey Scientific Investigations Report 2010-5099.

FWC Management Plan. 2015. *Suwannee Ridge Wildlife and Environmental Area*. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.

NRCS Soil Conservation Survey. 2017. *Soil Survey of Hamilton County, Florida*. United States Department of Agriculture, Washington, D.C.

Figures



Legend

ProjectLocation

County Boundary

FWC Suwannee Ridge WEA Project

Site Vicinity Map

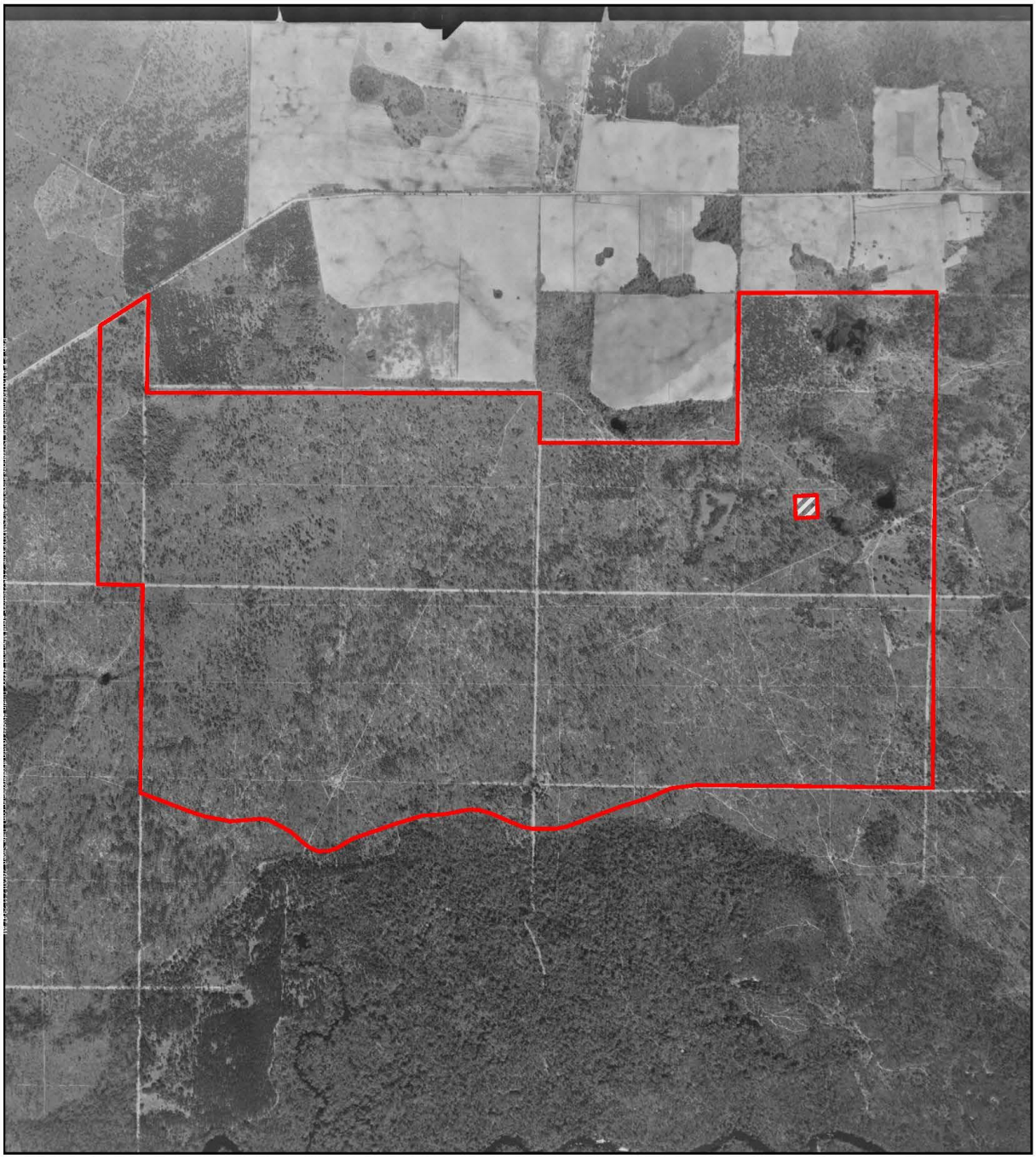
N 0 2 4 Miles

amec foster wheeler

Figure 1

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 1 Site Vicinity Map.mxd

Project # 6063-16-0271



Data Sources: USGS 2017 (AERIAL 1952); FWC 2016; AMEC FW 2017

Legend

Project Boundary - 1428 Acres

Cemetery Not Part of Project Area

FWC Suwannee Ridge WEA Project

1952 Historic Aerial Map

N

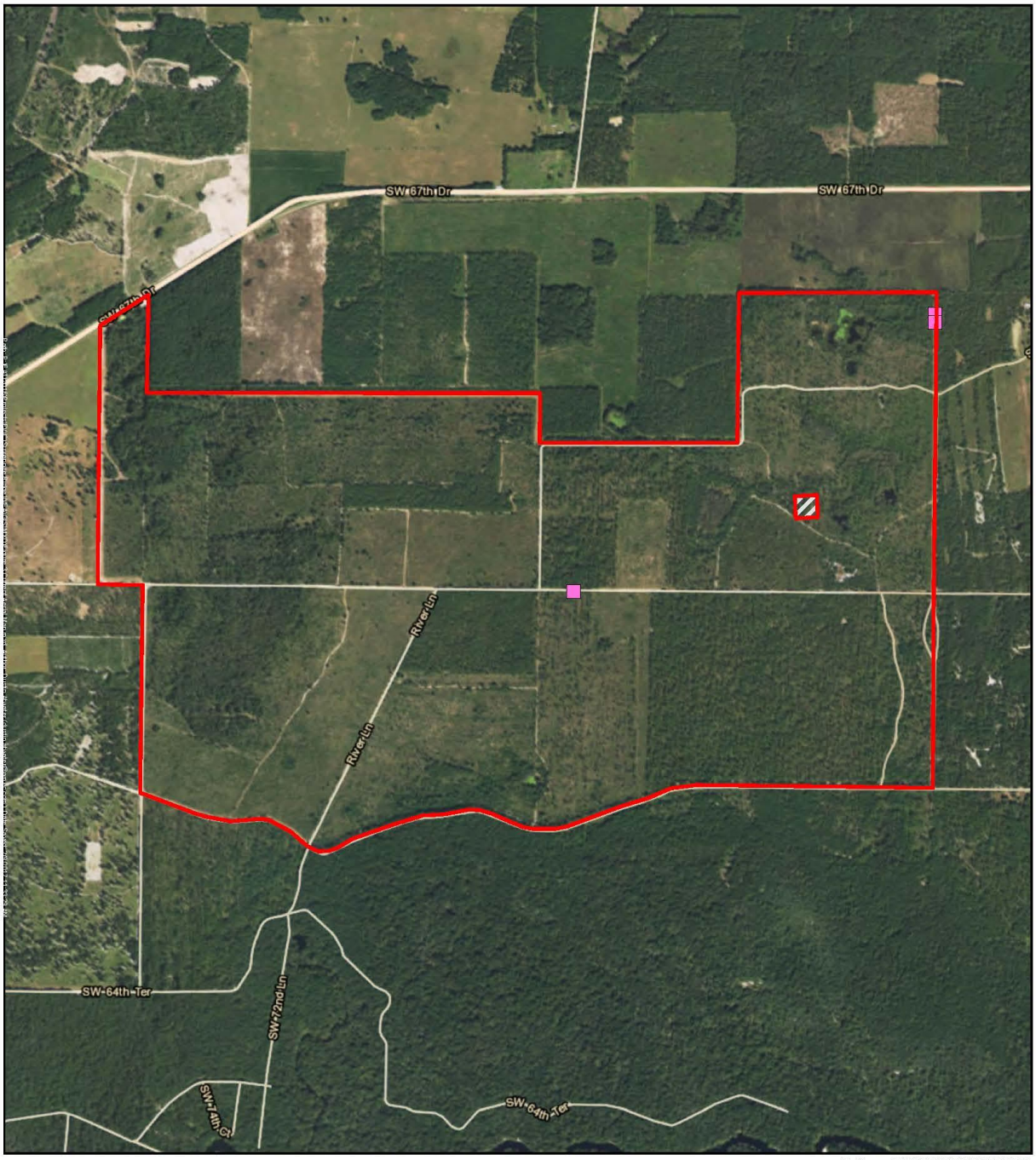
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amec foster wheeler

Figure 2

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 2 1952 Historic Aerial Map.mxd

Project # 6063-16-0271



Legend

- Project Boundary - 1428 Acres
- Cemetery Not Part of Project Area
- Existing Water Control Structures

FWC Suwannee Ridge WEA Project

Current Aerial Map

N

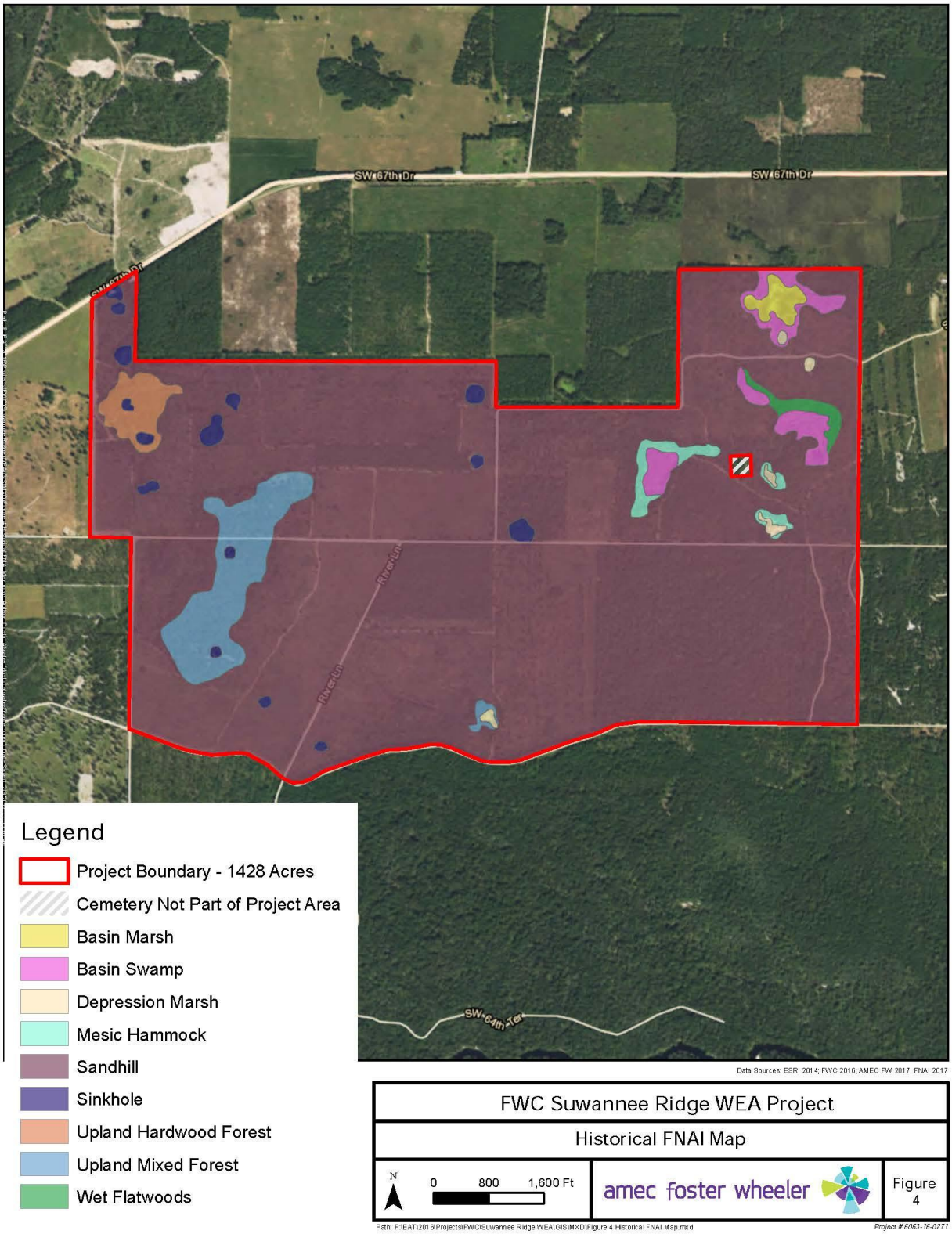
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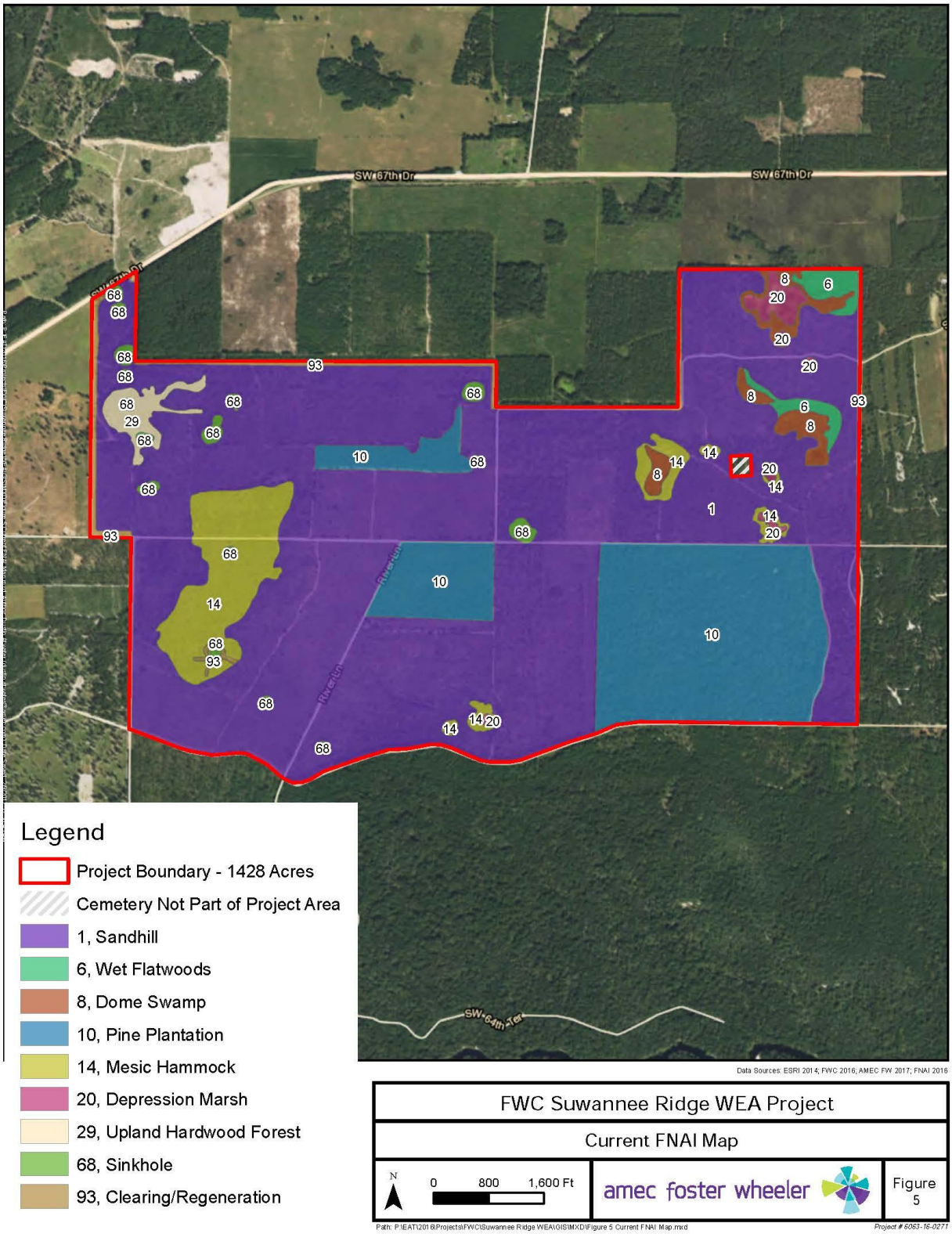
amec foster wheeler

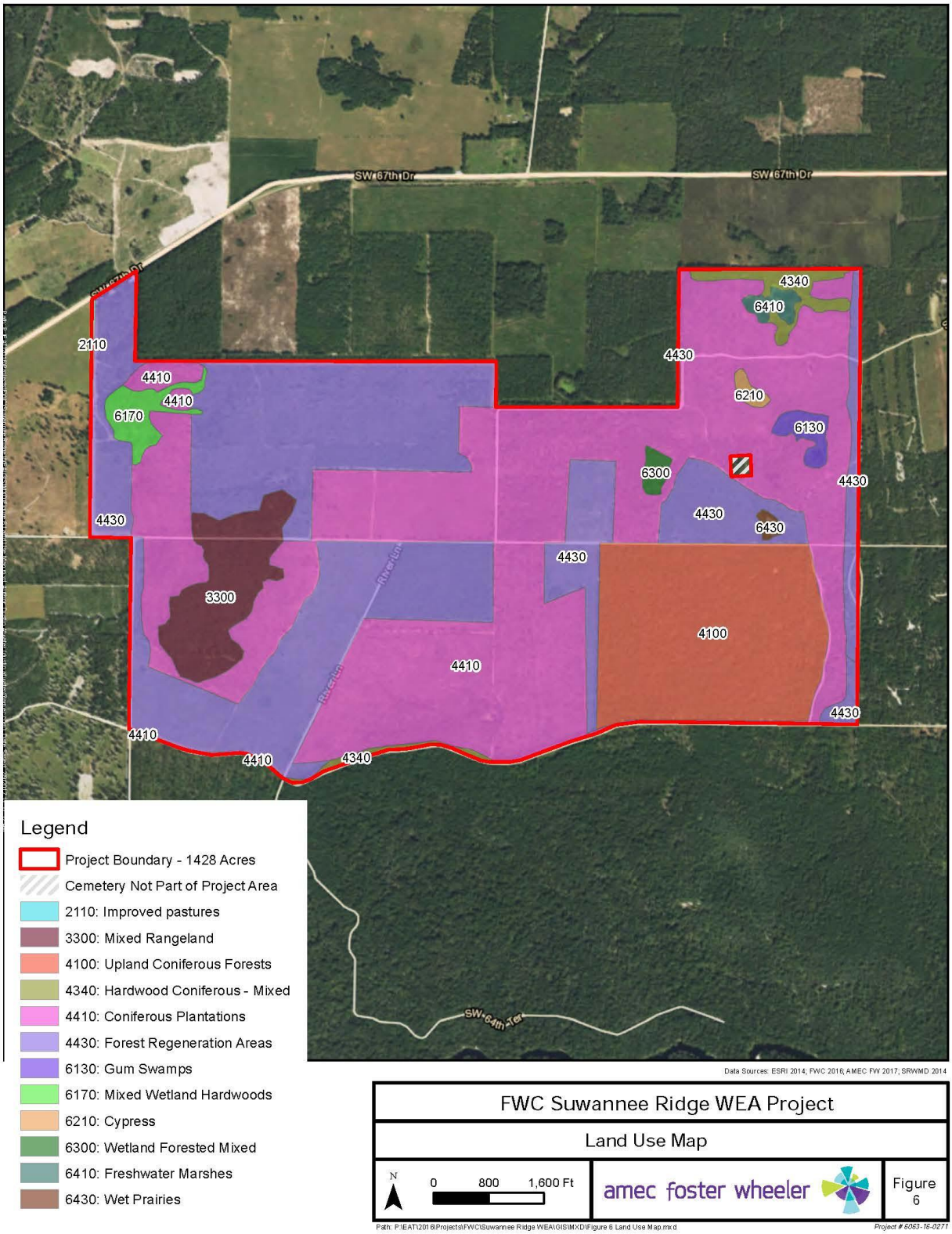
Figure 3

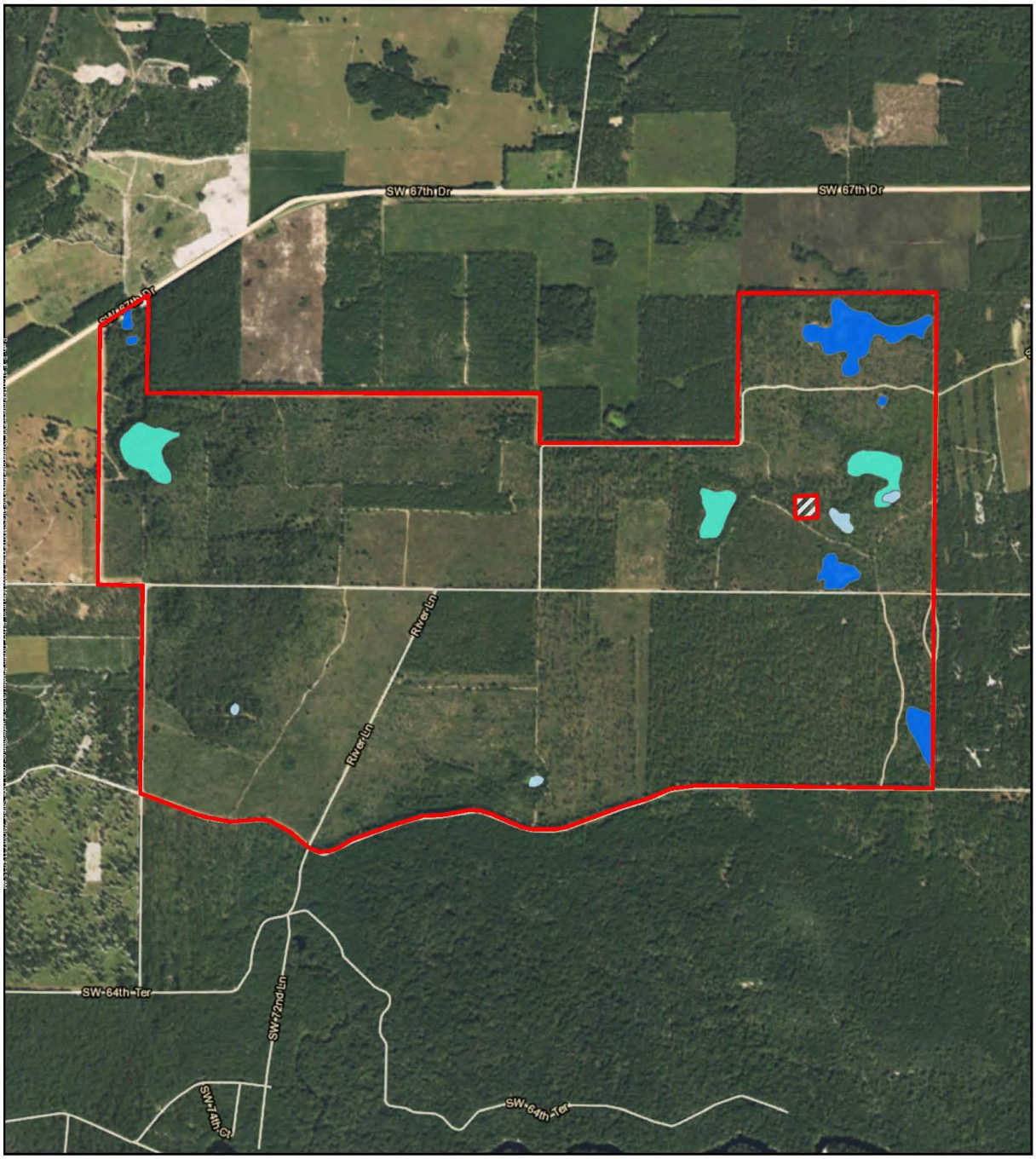
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 3 Current Aerial Map.mxd

Project # 6063-16-0271


SW 67th Dr
SW 67th Dr
SW 64th Ter
Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
Basin Marsh
Basin Swamp
Depression Marsh
Mesic Hammock
Sandhill
Sinkhole
Upland Hardwood Forest
Upland Mixed Forest
Wet Flatwoods
Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; FNAI 2017
FWC Suwannee Ridge WEA Project
Historical FNAI Map
N
0
800
1,600 Ft
amec foster wheeler
Figure 4
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 4 Historical FNAI Map.mxd
Project # 6063-16-0271


SW 67th Dr
SW 67th Dr
SW 64th Ter
Riverlin
Riverlin
Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
1, Sandhill
6, Wet Flatwoods
8, Dome Swamp
10, Pine Plantation
14, Mesic Hammock
20, Depression Marsh
29, Upland Hardwood Forest
68, Sinkhole
93, Clearing/Regeneration
Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; FNAI 2016
FWC Suwannee Ridge WEA Project
Current FNAI Map
N
0
800
1,600 Ft
amec foster wheeler
Figure 5
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 5 Current FNAI Map.mxd
Project # 6063-16-0271


SW 67th Dr
SW 67th Dr
SW 64th Ter
2110
4410
4410
6170
4340
6410
4430
6210
6130
6300
4430
4430
6430
4430
4430
3300
4100
4410
4410
4410
4340
4430
Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
2110: Improved pastures
3300: Mixed Rangeland
4100: Upland Coniferous Forests
4340: Hardwood Coniferous - Mixed
4410: Coniferous Plantations
4430: Forest Regeneration Areas
6130: Gum Swamps
6170: Mixed Wetland Hardwoods
6210: Cypress
6300: Wetland Forested Mixed
6410: Freshwater Marshes
6430: Wet Prairies
Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; SRWMD 2014
FWC Suwannee Ridge WEA Project
Land Use Map
N
0
800
1,600 Ft
amec foster wheeler
Figure 6
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 6 Land Use Map.mxd
Project # 6063-16-0271



Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; NWI 2011

Legend

- Project Boundary - 1428 Acres
- Cemetery Not Part of Project Area
- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND

FWC Suwannee Ridge WEA Project

NWI Map

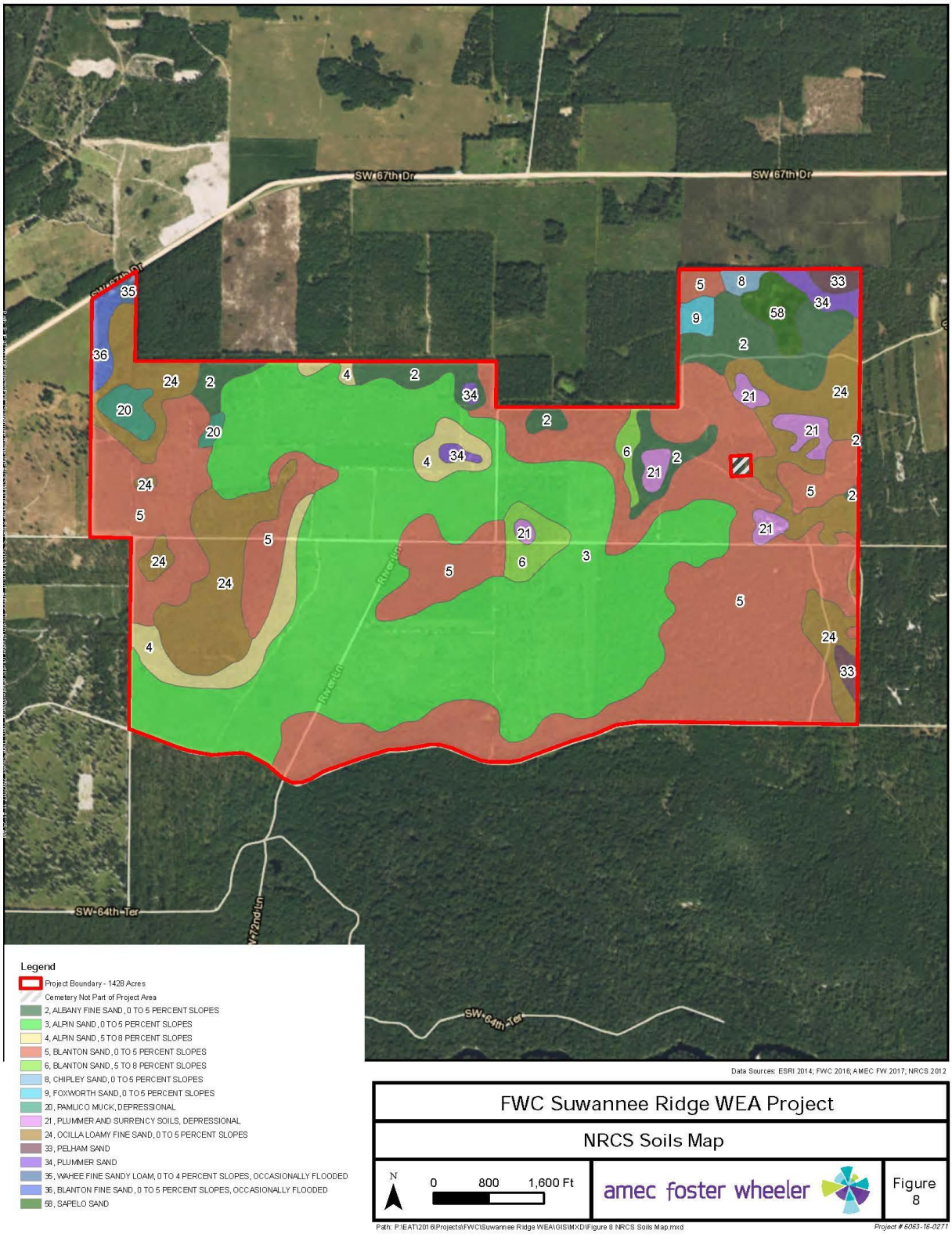
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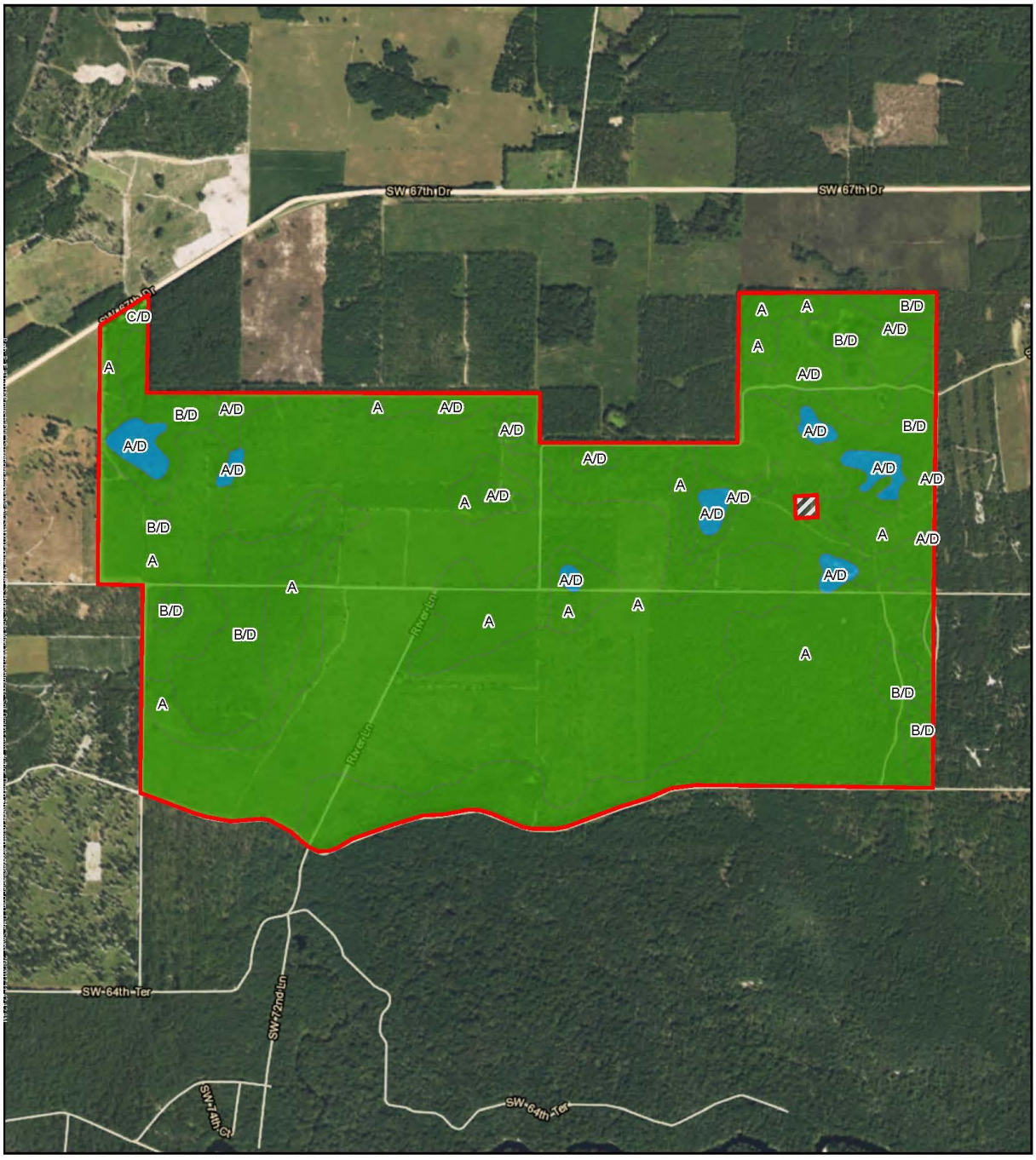
amec foster wheeler

Figure 7

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 7 NWI Map.mxd

Project # 6063-16-0271


SW 67th Dr
SW 67th Dr
SW 64th Ter
SW 64th Ter
Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
2, ALBANY FINE SAND, 0 TO 5 PERCENT SLOPES
3, ALPIN SAND, 0 TO 5 PERCENT SLOPES
4, ALPIN SAND, 5 TO 8 PERCENT SLOPES
5, BLANTON SAND, 0 TO 5 PERCENT SLOPES
6, BLANTON SAND, 5 TO 8 PERCENT SLOPES
8, CHIPLEY SAND, 0 TO 5 PERCENT SLOPES
9, FOXWORTH SAND, 0 TO 5 PERCENT SLOPES
20, PAMLICO MUCK, DEPRESSIONAL
21, PLUMMER AND SURRENCY SOILS, DEPRESSIONAL
24, OCILLA LOAMY FINE SAND, 0 TO 5 PERCENT SLOPES
33, PELHAM SAND
34, PLUMMER SAND
35, WAHEE FINE SANDY LOAM, 0 TO 4 PERCENT SLOPES, OCCASIONALLY FLOODED
36, BLANTON FINE SAND, 0 TO 5 PERCENT SLOPES, OCCASIONALLY FLOODED
58, SAPELO SAND
Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; NRCS 2012
FWC Suwannee Ridge WEA Project
NRCS Soils Map
N
0
800
1,600 Ft
amec foster wheeler
Figure 8
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 8 NRCS Soils Map.mxd
Project # 6063-16-0271



Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; NRCS 2012

Legend

- Project Boundary - 1428 Acres
- Cemetery Not Part of Project Area

Hydric Soils

- NO
- YES

FWC Suwannee Ridge WEA Project

NRCS Hydric Soils Map With Hydrologic Soil Groups

N

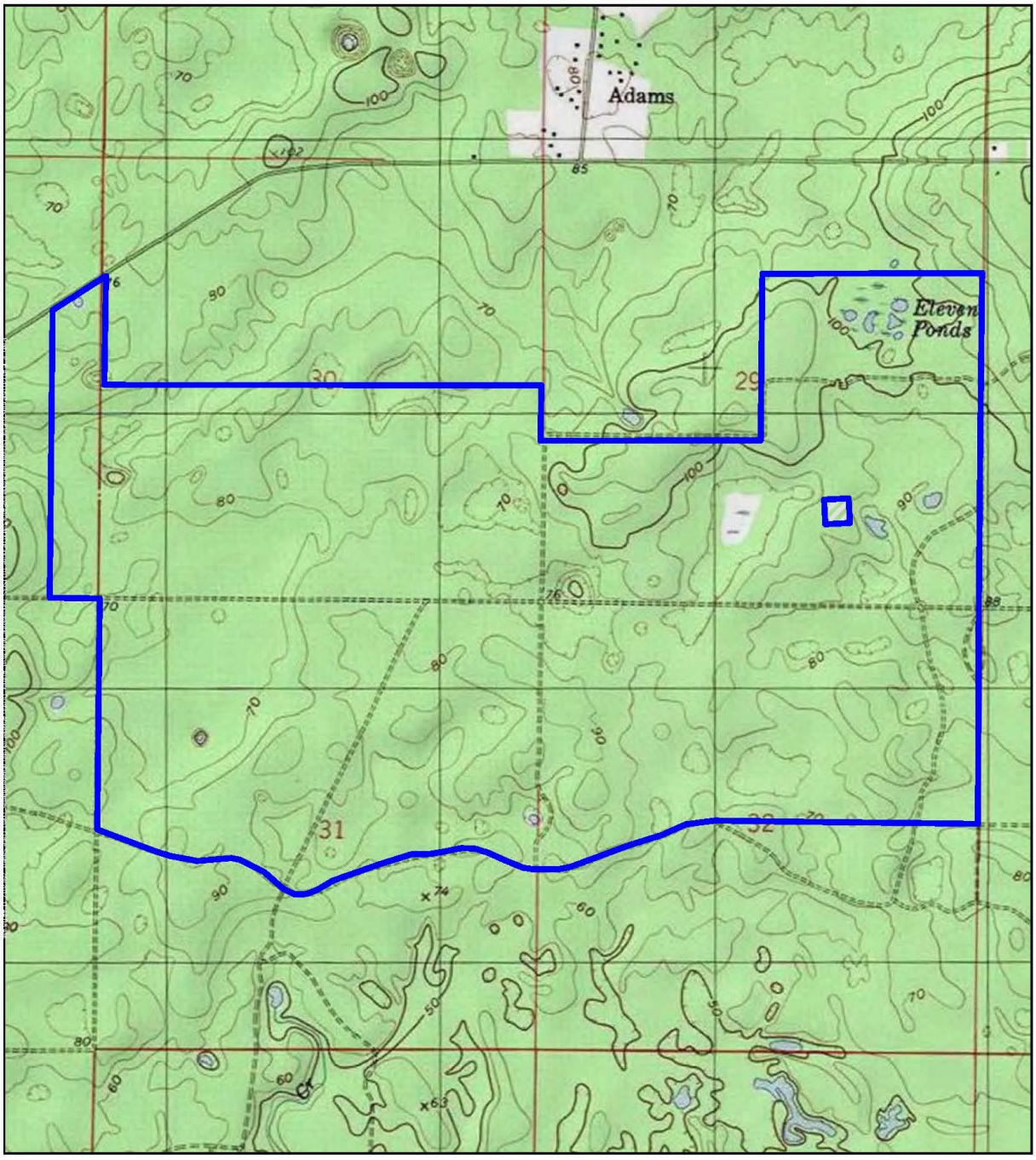
0 800 1,600 Ft

amec foster wheeler

Figure 9

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 9 NRCS Hydric Soils Map With Hydrologic Soil Groups.mxd

Project # 6063-16-0271



Data Sources: FWC 2016; AMEC FW 2017; USGS 2016

Legend

Project Boundary - 1428 Acres

Cemetery Not Part of Project Area

FWC Suwannee Ridge WEA Project

USGS Topographic Map

N

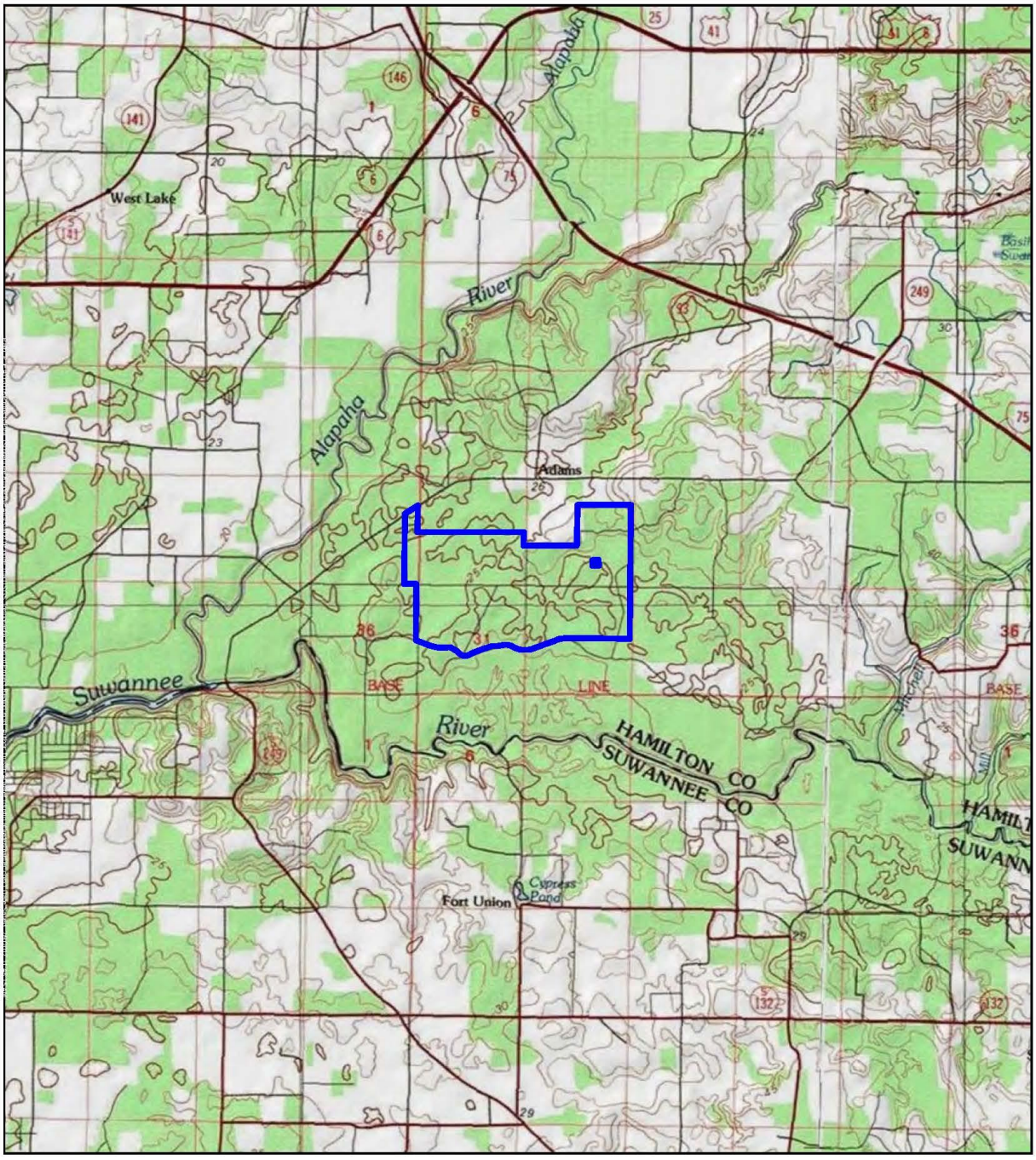
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amec foster wheeler

Figure 10

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 10 USGS Topographic Map.mxd

Project # 6063-16-0271



Legend

Project Boundary - 1428 Acres

Cemetery Not Part of Project Area

FWC Suwannee Ridge WEA Project

USGS Topographic Map of Project Region

N

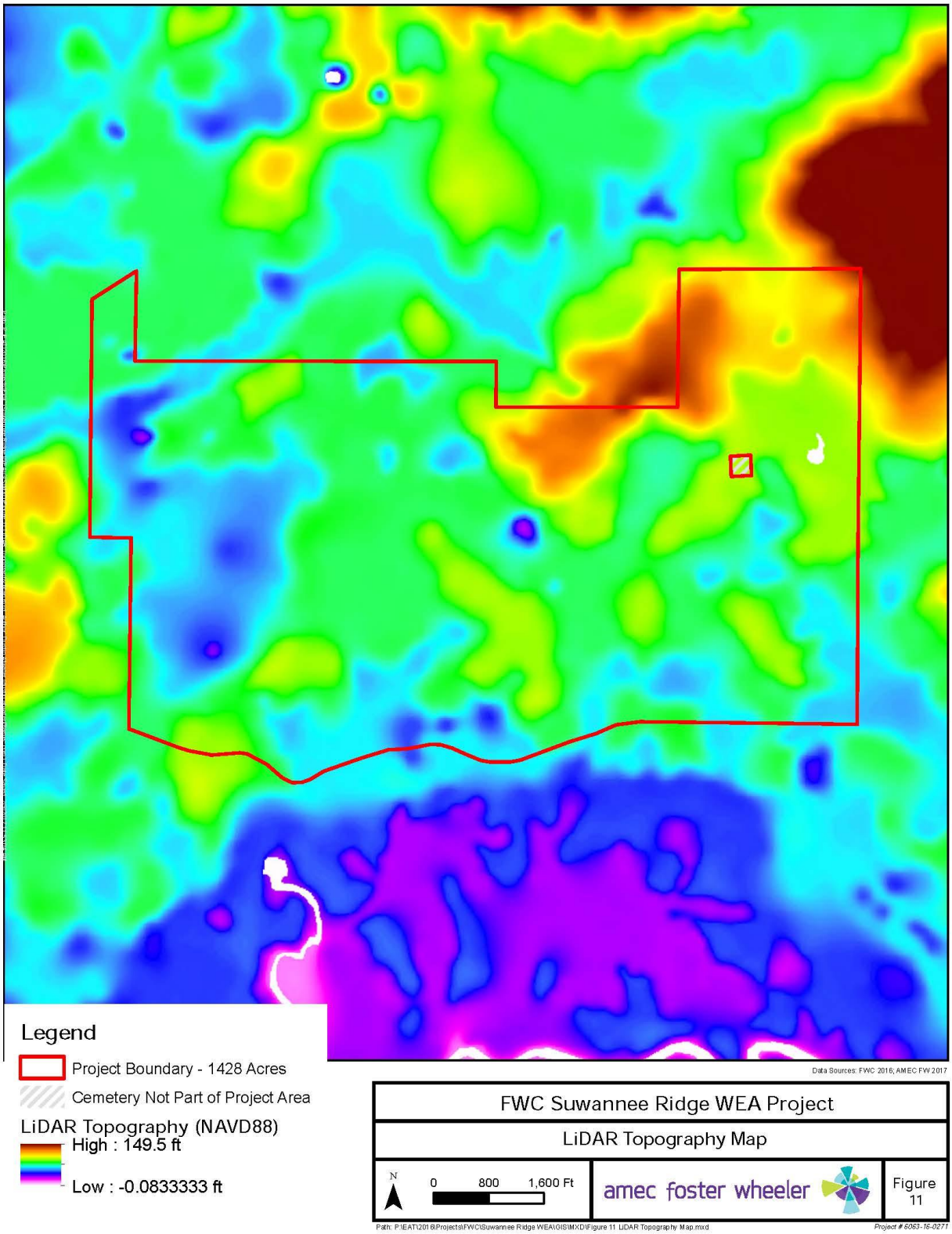
0 3,000 6,000 Ft

amec foster wheeler

Figure 10a

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 10a USGS Topographic Map of Project Region.mxd

Project # 6063-16-0271


Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
LiDAR Topography (NAVD88)
High : 149.5 ft
Low : -0.0833333 ft
Data Sources: FWC 2016; AMEC FW 2017
FWC Suwannee Ridge WEA Project
LiDAR Topography Map
N
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1,600 Ft
amec foster wheeler
Figure 11
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 11 LiDAR Topography Map.mxd
Project # 6063-16-0271



Data Sources: USGS 2017 (AERIAL 1952); FWC 2016; AMEC FW 2017

Legend

- Project Boundary - 1428 Acres
- Cemetery Not Part of Project Area
- Subbasin Boundary
- Flow Direction

FWC Suwannee Ridge WEA Project

Historic Drainage Subbasins and Flow Patterns

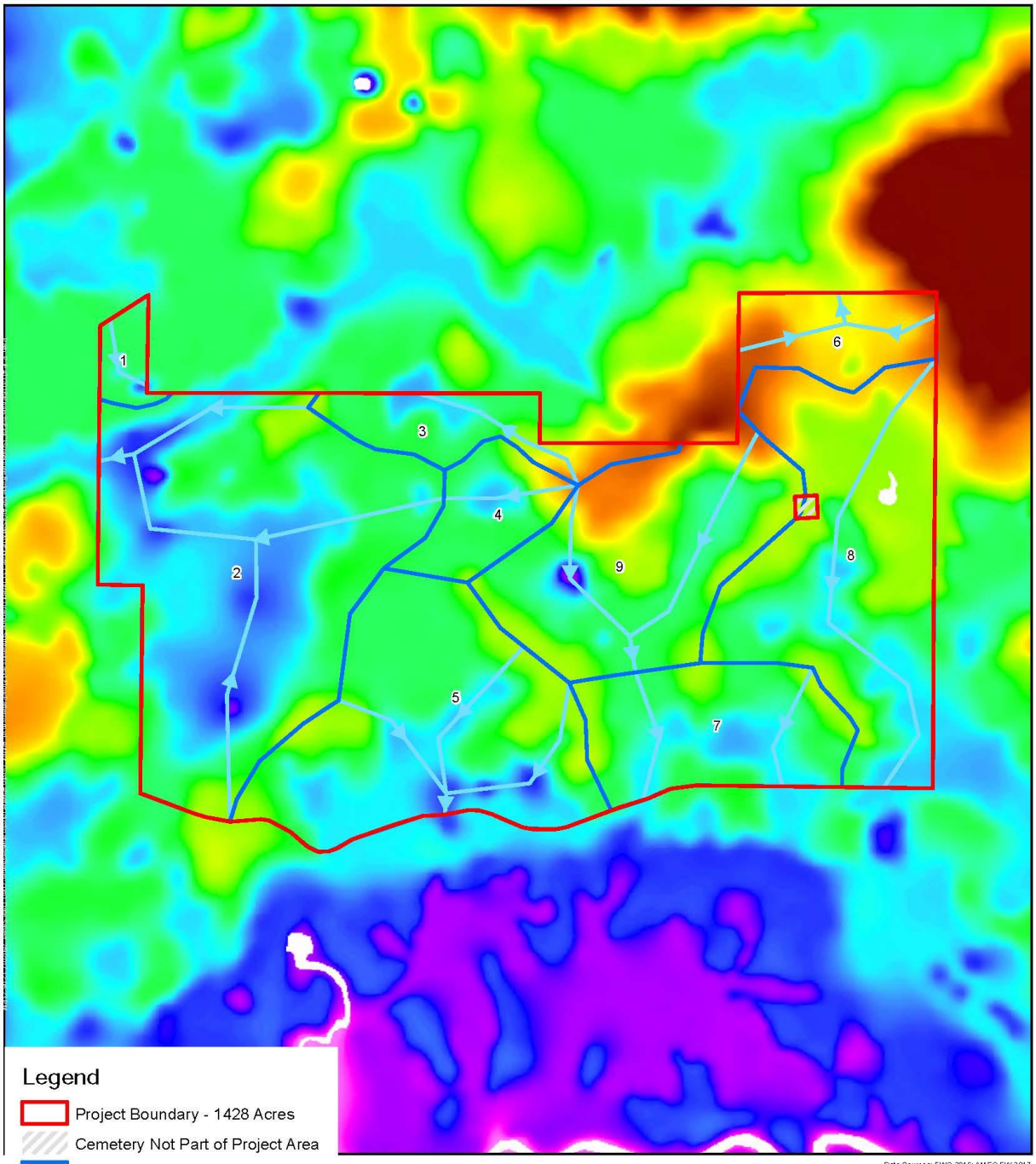
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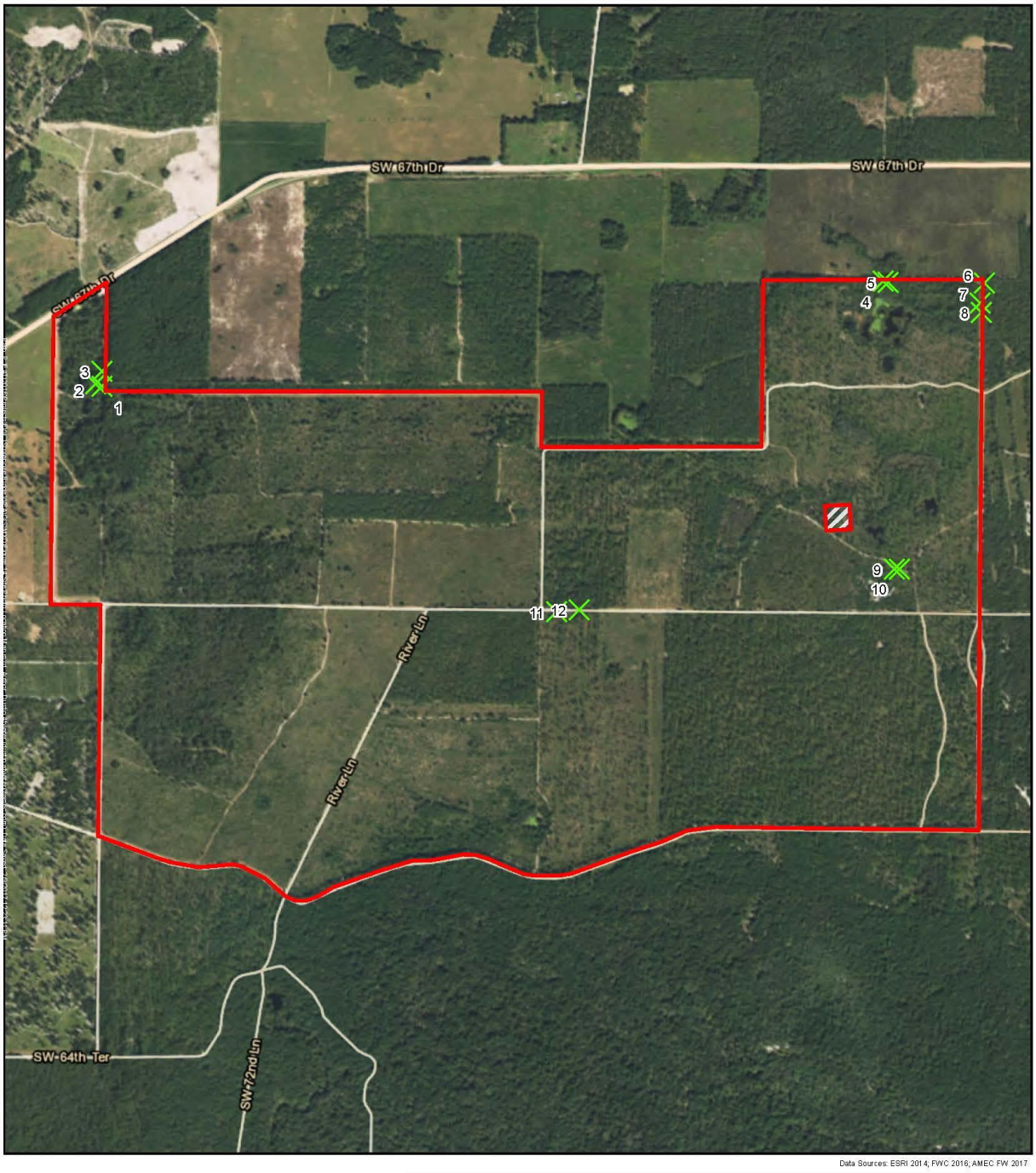
amec foster wheeler

Figure 12

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 12 Historic Drainage Subbasins and Flow Patterns.mxd

Project # 6063-16-0271


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Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
Subbasin Boundary
Flow Direction
LiDAR Topography (NAVD88)
High : 149.5 ft
Low : -0.0833333 ft
Data Sources: FWC 2016; AMEC FW 2017
FWC Suwannee Ridge WEA Project
Current Drainage Subbasins and Flow Patterns
N
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800
1,600 Ft
amec foster wheeler
Figure 13
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 13 Current Drainage Subbasins and Flow Patterns.mxd
Project # 6063-16-0271



Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017

Legend

- Project Boundary - 1428 Acres
- Cemetery Not Part of Project Area
- Site Photo Locations

FWC Suwannee Ridge WEA Project

Site Photo Location Map

N

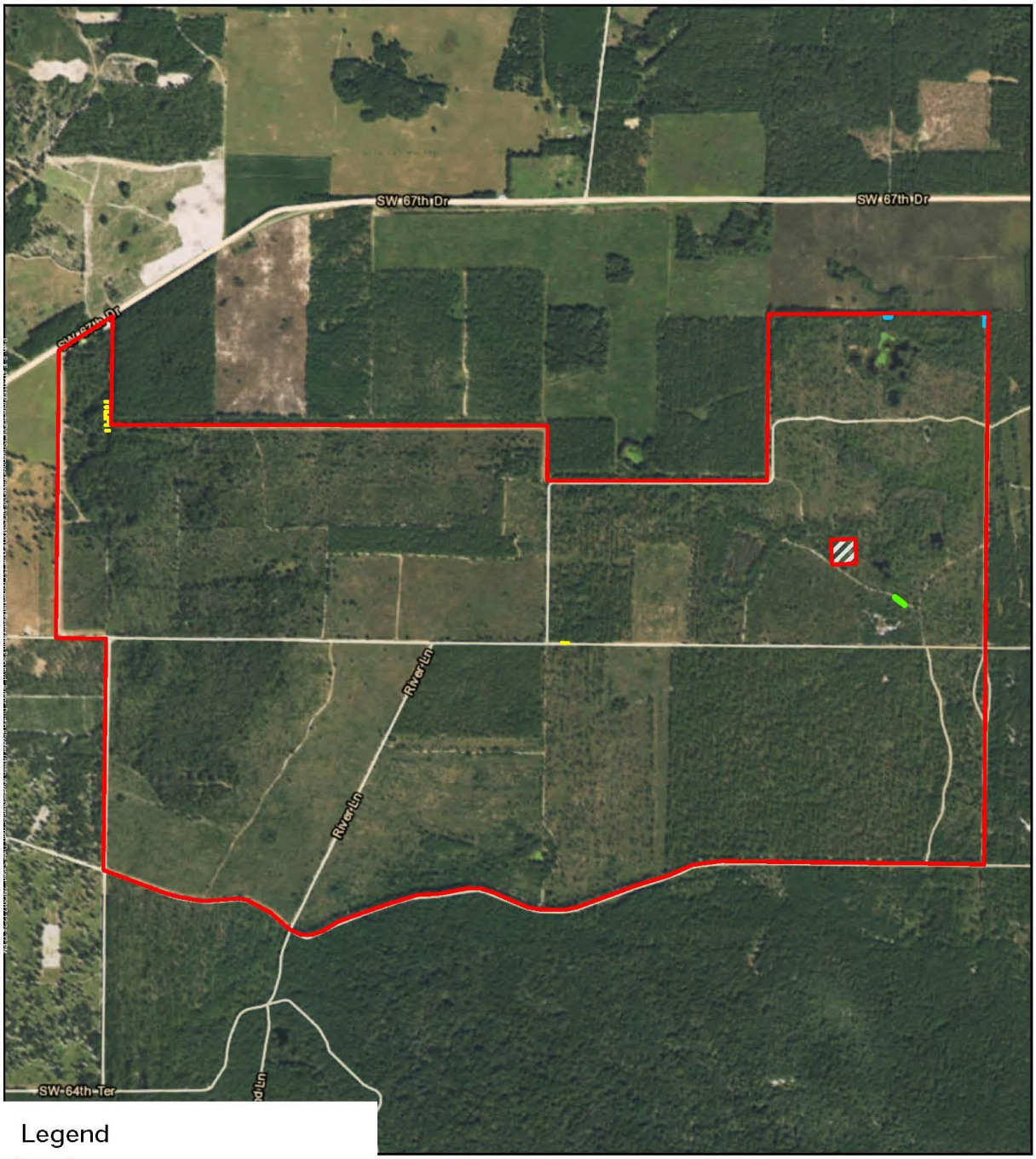
0 800 1,600 Ft

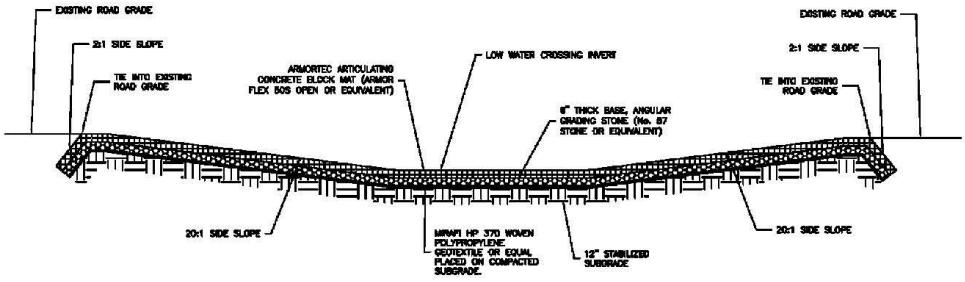
amec foster wheeler

Figure 14

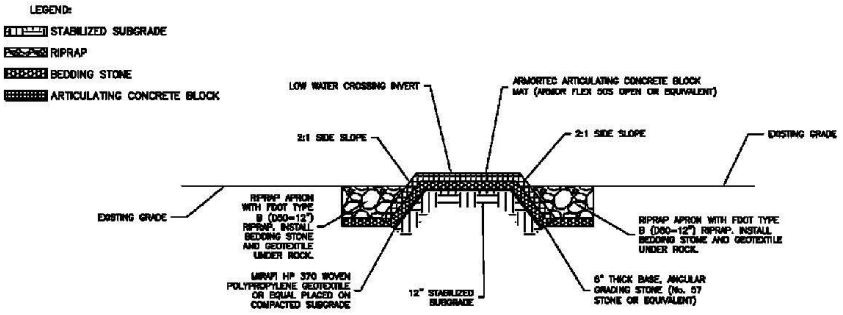
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 14 Site Photo Location Map.mxd

Project # 6063-16-0271

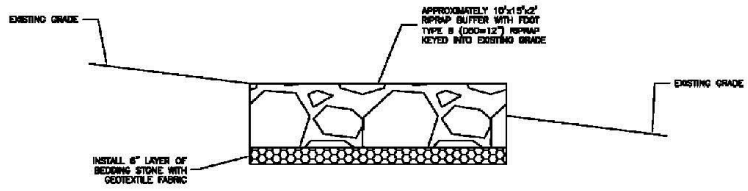

SW 67th Dr
SW 67th Dr
SW 67th Dr
River Ln
River Ln
SW 64th Ter
Legend
Project Boundary - 1428 Acres
Cemetery Not Part of Project Area
Low Water Crossing
Road Stabilization
Riprap
Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017
FWC Suwanne Ridge WEA Project
Conceptual Restoration Plan
N
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amec foster wheeler
Figure 15
Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 15 Conceptual Restoration Plan.mxd
Project # 6063-16-0271



TYPICAL LOW WATER CROSSING PROFILE



TYPICAL LOW WATER CROSSING CROSS SECTION



TYPICAL RIPRAP BUFFER PROFILE

NOTE: THE SIZES, EXTENTS, AND DETAILS OF THE RECOMMENDED LOW WATER CROSSINGS AND RIPRAP BUFFERS ARE SUBJECT TO CHANGE DURING FINAL DESIGN.

Data Sources: AMEC FW 2017

FWC Suwanne Ridge WEA Project		
Conceptual Restoration Plan Details		
Not to Scale	amec foster wheeler	Figure 15a

Path: P:\EAT\2016\Projects\FWC\Suwannee Ridge WEA\GIS\MXD\Figure 15a Conceptual Restoration Plan Details.mxd

Project # 6063-16-0271

Appendix A



Photo No. 1. Northwest unimproved road slope. View to the south.



Photo No. 2. Northwest unimproved road erosion into sink. View to the east.

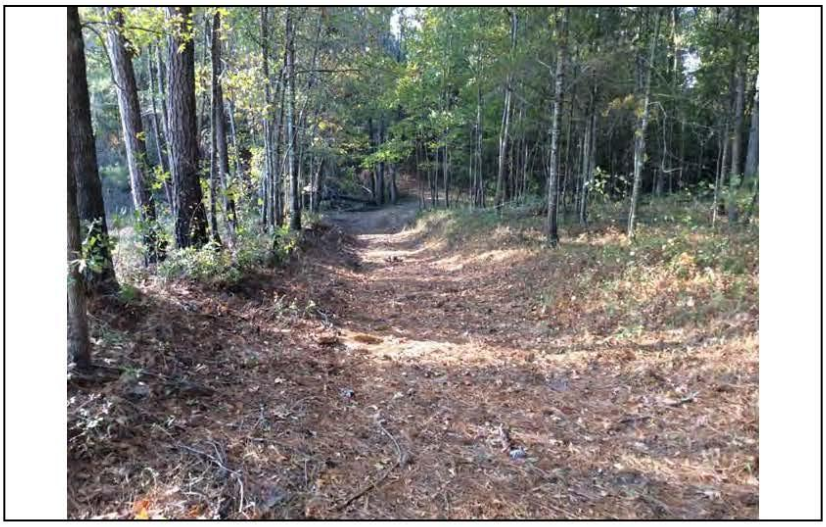


Photo No. 3. Northwest unimproved road slope. View to the south.



Photo No. 4. Site discharge location north of the Eleven Ponds marsh area. View to the north.



Photo No. 5. Ridge Road north of the Eleven Ponds marsh area near discharge location. View to the east.



Photo No. 6. Silted-in culvert and ditch outside northeast property boundary. View to the south.

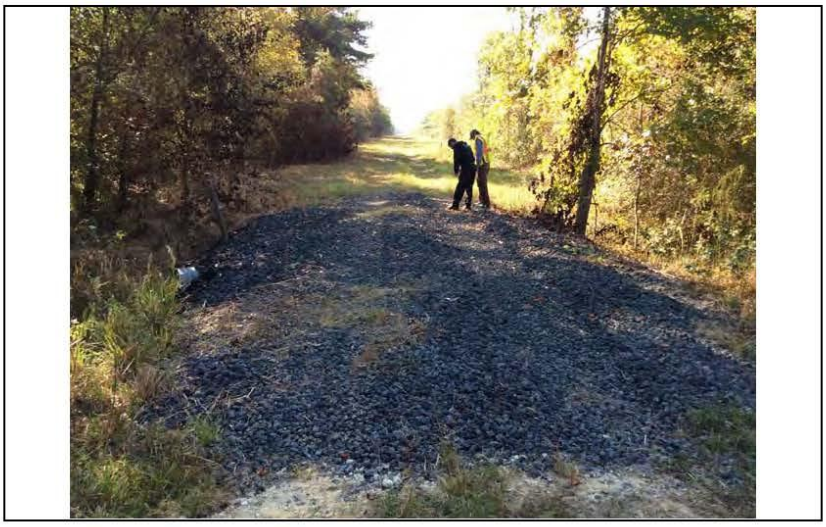


Photo No. 7. East Road culvert. View to the south.



Photo No. 8. East Road culverts and inundated area to the north. View to the north.



Photo No. 9. Problem area on Confederate Road near cemetery. View to the west.



Photo No. 10. Low point in Confederate Road problem area. View to the north.



Photo No. 11. Eroded area north of Main Road. View to the northeast.



Photo No. 12. Culvert under Main Road. View to the south.

Appendix B

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hamilton County, Florida



January 23, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

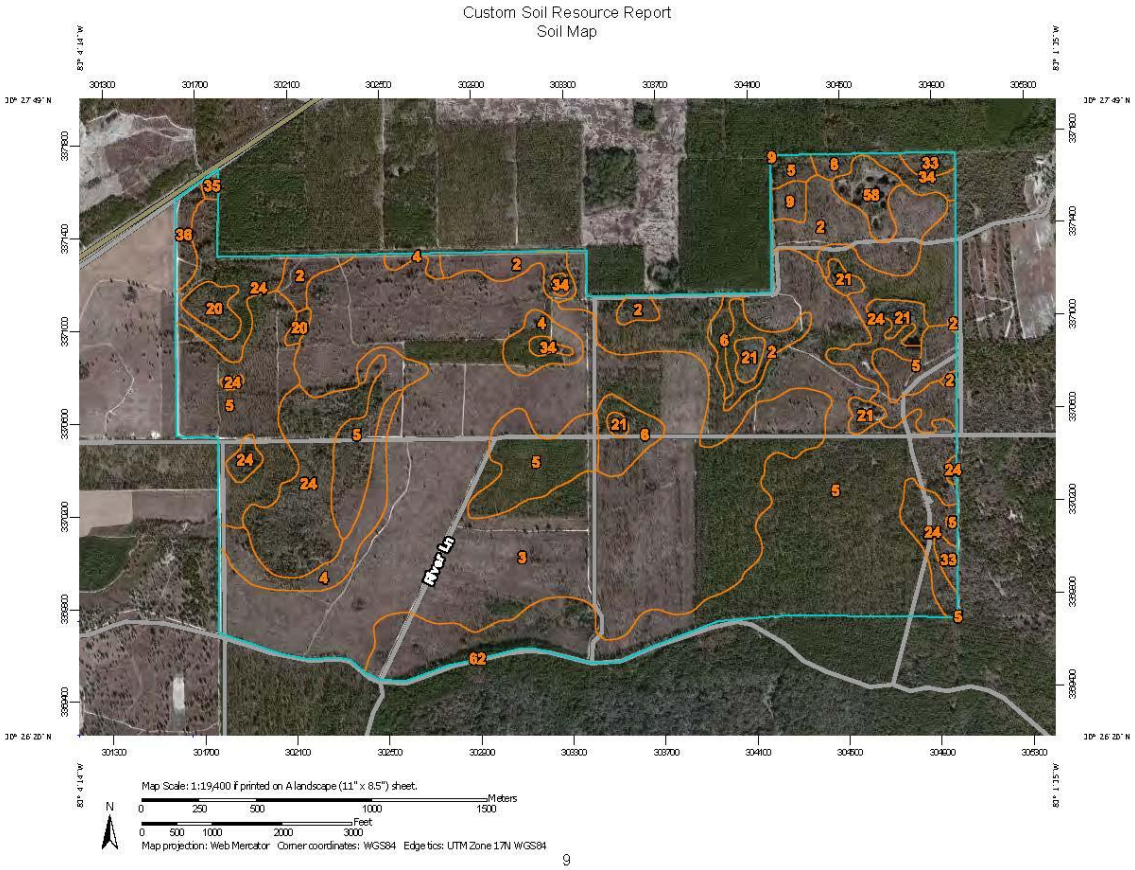
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


Custom Soil Resource Report
Soil Map
River Ln
Map Scale: 1:19,400 if printed on A landscape (11" x 8.5") sheet.
Meters
0 250 500 1000 1500
Feet
0 500 1000 2000 3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84
N

9

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hamilton County, Florida
Survey Area Data: Version 15, Sep 23, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 9, 2010—Jan 14, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Hamilton County, Florida (FL047)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Albany fine sand, 0 to 5 percent slopes	82.7	5.8%
3	Alpin sand, 0 to 5 percent slopes	548.8	38.2%
4	Alpin sand, 5 to 8 percent slopes	45.2	3.1%
5	Blanton sand, 0 to 5 percent slopes	483.1	33.6%
6	Blanton sand, 5 to 8 percent slopes	21.3	1.5%
8	Chipley sand, 0 to 5 percent slopes	4.1	0.3%
9	Foxworth sand, 0 to 5 percent slopes	6.0	0.4%
20	Pamlico muck, depressional	12.2	0.9%
21	Plummer and Surrency soils, depressional	22.3	1.5%
24	Ocilla loamy fine sand, 0 to 5 percent slopes	166.5	11.6%
33	Pelham sand	8.7	0.6%
34	Plummer sand	11.7	0.8%
35	Wahee fine sandy loam, 0 to 4 percent slopes, occasionally flooded	1.8	0.1%
36	Blanton fine sand, 0 to 5 percent slopes, occasionally flooded	8.9	0.6%
58	Sapelo sand	14.9	1.0%
62	Resota-Blanton-Bigbee complex, undulating, occasionally flooded	0.0	0.0%
Totals for Area of Interest		**1,438.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic

class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hamilton County, Florida

2—Albany fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2v178
Elevation: 10 to 190 feet
Mean annual precipitation: 51 to 59 inches
Mean annual air temperature: 66 to 70 degrees F
Frost-free period: 280 to 310 days
Farmland classification: Not prime farmland

Map Unit Composition

Albany and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Albany

Setting

Landform: Ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
E - 9 to 57 inches: fine sand
Bt - 57 to 63 inches: fine sandy loam
Btg - 63 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A/D
Other vegetative classification: North Florida Flatwoods (R138XY004FL), Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Upland Hardwood Hammock (R152AY008FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)
Hydric soil rating: No

Hurricane

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: North Florida Flatwoods (R152AY004FL), Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

Chipley

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, flats on marine terraces, rises on marine terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

3—Alpin sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 17kfx
Elevation: 20 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Alpin and similar soils: 90 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alpin

Setting

Landform: Knolls on marine terraces, ridges on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits or sandy marine deposits

Typical profile

Ap - 0 to 4 inches: sand
E - 4 to 47 inches: sand
E and Bt - 47 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G138XA111FL)
Hydric soil rating: No

Minor Components

Albany

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

Blanton

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex

Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)
Hydric soil rating: No

Chipley

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

4—Alpin sand, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: 17kg8
Elevation: 20 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Alpin and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alpin

Setting

Landform: Knolls on marine terraces, hillslopes on ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits or sandy marine deposits

Typical profile

Ap - 0 to 4 inches: sand
E - 4 to 47 inches: sand
E and Bt - 47 to 80 inches: sand

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G138XA111FL)
Hydric soil rating: No

Minor Components

Blanton

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, hillslopes on ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)
Hydric soil rating: No

Albany

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

5—Blanton sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 17kgl
Elevation: 20 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Blanton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blanton

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

Ap - 0 to 9 inches: sand
E - 9 to 54 inches: sand
Bt - 54 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)
Hydric soil rating: No

Minor Components

Albany

Percent of map unit: 10 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

6—Blanton sand, 5 to 8 percent slopes

Map Unit Setting

National map unit symbol: 17kgy
Elevation: 20 to 350 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Blanton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blanton

Setting

Landform: Knolls on marine terraces, hillslopes on ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

Ap - 0 to 9 inches: sand
E - 9 to 54 inches: sand
Bt - 54 to 80 inches: sandy clay loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)

Hydric soil rating: No

Minor Components

Albany

Percent of map unit: 8 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

Alpin

Percent of map unit: 7 percent
Landform: Knolls on marine terraces, hillslopes on ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G138XA111FL)
Hydric soil rating: No

8—Chipley sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 17kh8
Elevation: 20 to 150 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Chipley and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chipley

Setting

Landform: Knolls on marine terraces, flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

Ap - 0 to 8 inches: sand

C - 8 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

Minor Components

Mascotte, non-hydric

Percent of map unit: 5 percent
Landform: Stream terraces on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: No

Pottsburg, non-hydric

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: No

9—Foxworth sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2ttkk

Elevation: 20 to 250 feet
Mean annual precipitation: 59 to 68 inches
Mean annual air temperature: 63 to 72 degrees F
Frost-free period: 209 to 295 days
Farmland classification: Not prime farmland

Map Unit Composition

Foxworth and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Foxworth

Setting

Landform: Ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 6 inches: sand
C - 6 to 67 inches: sand
Cg - 67 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: Longleaf Pine-Turkey Oak Hills (R133AY002FL)
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Minor Components

Lakeland

Percent of map unit: 4 percent
Landform: Hills on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R133AY002FL)
Hydric soil rating: No

Chipley

Percent of map unit: 1 percent
Landform: Ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G133AA131FL)
Hydric soil rating: No

20—Pamlico muck, depressional

Map Unit Setting

National map unit symbol: 17kfl
Elevation: 20 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Pamlico and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pamlico

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 25 inches: muck
Cg1 - 25 to 42 inches: sand
Cg2 - 42 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Organic soils in depressions and on flood plains (G138XA645FL)
Hydric soil rating: Yes

Minor Components

Mascotte, non-hydric
Percent of map unit: 3 percent
Landform: Flats on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: No

Pelham, hydric
Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: Yes

Pottsburg, hydric
Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: Yes

Plummer, depressional
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G138XA145FL)
Hydric soil rating: Yes

21—Plummer and Surrency soils, depressional

Map Unit Setting
National map unit symbol: 17kfm
Elevation: 20 to 400 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition
Plummer, depressional, and similar soils: 50 percent
Surrency, depressional, and similar soils: 33 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plummer, Depressional

Setting
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and loamy marine deposits

Typical profile
A - 0 to 9 inches: sand
E - 9 to 52 inches: sand
Btg - 52 to 80 inches: sandy clay loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G138XA145FL)
Hydric soil rating: Yes

Description of Surrency, Depressional

Setting
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and loamy marine deposits

Typical profile
A - 0 to 10 inches: mucky sand
Eg - 10 to 24 inches: sand
Btg - 24 to 80 inches: fine sandy loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G138XA245FL)
Hydric soil rating: Yes

Minor Components

Mascotte, hydric
Percent of map unit: 10 percent
Landform: Flats on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: Yes

Pottsburg, non-hydric
Percent of map unit: 7 percent

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: No

24—Ocilla loamy fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 17kfq
Elevation: 20 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Ocilla and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ocilla

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 10 inches: loamy fine sand
E - 10 to 34 inches: loamy fine sand
Bt - 34 to 52 inches: fine sandy loam
BCg - 52 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G138XA231FL)
Hydric soil rating: No

Minor Components

Blanton
Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)
Hydric soil rating: No

Pelham, non-hydric
Percent of map unit: 5 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: No

33—Pelham sand

Map Unit Setting
National map unit symbol: 17kg1
Elevation: 20 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition
Pelham, non-hydric, and similar soils: 60 percent
Pelham, hydric, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pelham, Non-hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: sand
Eg - 7 to 25 inches: sand
Btg1 - 25 to 32 inches: sandy loam
Btg2 - 32 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: No

Description of Pelham, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: sand
Eg - 7 to 25 inches: sand
Btg1 - 25 to 32 inches: sandy loam
Btg2 - 32 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained

Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G138XA241FL)
Hydric soil rating: Yes

Minor Components

Albany

Percent of map unit: 10 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

34—Plummer sand

Map Unit Setting

National map unit symbol: 17kg2
Elevation: 10 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Plummer, non-hydric, and similar soils: 60 percent
Plummer, hydric, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plummer, Non-hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 9 inches: sand
E - 9 to 52 inches: sand
Btg - 52 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: No

Description of Plummer, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 9 inches: sand
E - 9 to 52 inches: sand
Btg - 52 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: Yes

Minor Components

Sapelo, non-hydric

Percent of map unit: 10 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: No

35—Wahee fine sandy loam, 0 to 4 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 17kg3
Elevation: 20 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Wahee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wahee

Setting

Landform: Flood plains on marine terraces

Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sandy loam
Btg - 5 to 56 inches: clay
BC - 56 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Other vegetative classification: Loamy and clayey soils on stream terraces and flood plains (G138XA334FL)
Hydric soil rating: No

Minor Components

Eunola

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces and flood plains (G138XA334FL)
Hydric soil rating: No

Ocilla

Percent of map unit: 5 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G138XA231FL)
Hydric soil rating: No

36—Blanton fine sand, 0 to 5 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 17kg4
Elevation: 40 to 300 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Blanton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blanton

Setting

Landform: Stream terraces on marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
E - 9 to 54 inches: sand
Bt - 54 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on stream terraces or flood plains (G138XA124FL)

Hydric soil rating: No

Minor Components

Alpin

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G138XA111FL)
Hydric soil rating: No

Kenansville

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on stream terraces or flood plains (G138XA114FL)
Hydric soil rating: No

58—Sapelo sand

Map Unit Setting

National map unit symbol: 17kgw
Elevation: 10 to 450 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition

Sapelo, non-hydric, and similar soils: 75 percent
Sapelo, hydric, and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sapelo, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: sand
E - 7 to 19 inches: sand
Bh - 19 to 28 inches: sand
E' - 28 to 48 inches: sand
Bt - 48 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: No

Description of Sapelo, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: sand
E - 7 to 19 inches: sand
Bh - 19 to 28 inches: sand
E' - 28 to 48 inches: sand
Bt - 48 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G138XA141FL)
Hydric soil rating: Yes

Minor Components

Albany
Percent of map unit: 10 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G138XA131FL)
Hydric soil rating: No

62—Resota-Blanton-Bigbee complex, undulating, occasionally flooded

Map Unit Setting
National map unit symbol: 17kh1
Elevation: 20 to 250 feet
Mean annual precipitation: 48 to 56 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 243 to 273 days
Farmland classification: Not prime farmland

Map Unit Composition
Resota and similar soils: 35 percent
Blanton and similar soils: 33 percent
Bigbee and similar soils: 25 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Resota

Setting
Landform: Flood plains on marine terraces, rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 25 inches: fine sand
Bw - 25 to 50 inches: fine sand
C - 50 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 49.88 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on stream terraces or flood plains (G138XA124FL)
Hydric soil rating: No

Description of Blanton

Setting

Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
E - 9 to 54 inches: sand
Bt - 54 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on stream terraces or flood plains (G138XA124FL)
Hydric soil rating: No

Description of Bigbee

Setting
Landform: Flood plains on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy fluviomarine deposits

Typical profile
A - 0 to 9 inches: fine sand
C - 9 to 80 inches: fine sand

Properties and qualities
Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on stream terraces or flood plains (G138XA114FL)
Hydric soil rating: No

Minor Components

Otela
Percent of map unit: 7 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G138XA121FL)

Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Suwannee Ridge WEA)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

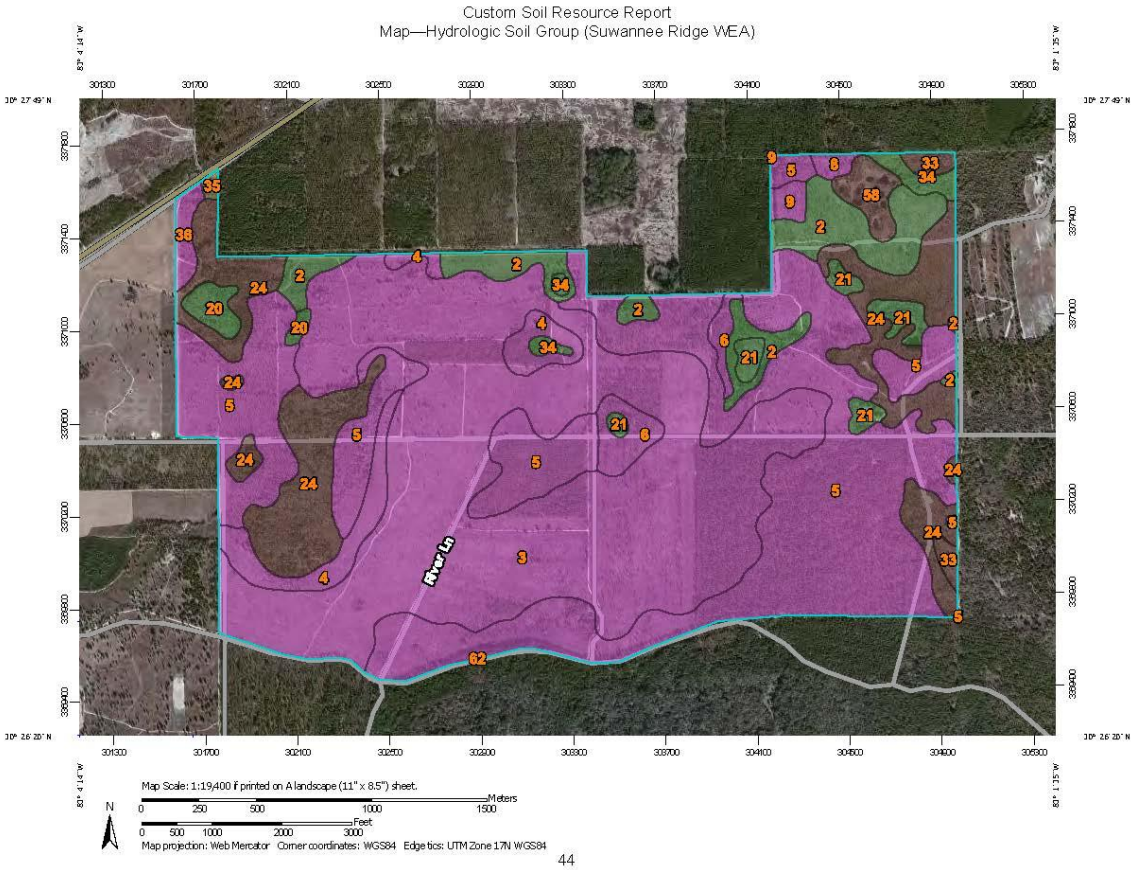
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.


Custom Soil Resource Report
Map—Hydrologic Soil Group (Suwannee Ridge WEA)
River Ln
Map Scale: 1:19,400 if printed on A landscape (11" x 8.5") sheet.
Meters
Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hamilton County, Florida
Survey Area Data: Version 15, Sep 23, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 9, 2010—Jan 14, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (Suwannee Ridge WEA)

Hydrologic Soil Group— Summary by Map Unit — Hamilton County, Florida (FL047)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
2	Albany fine sand, 0 to 5 percent slopes	A/D	82.7	5.8%
3	Alpin sand, 0 to 5 percent slopes	A	548.8	38.2%
4	Alpin sand, 5 to 8 percent slopes	A	45.2	3.1%
5	Blanton sand, 0 to 5 percent slopes	A	483.1	33.6%
6	Blanton sand, 5 to 8 percent slopes	A	21.3	1.5%
8	Chipley sand, 0 to 5 percent slopes	A	4.1	0.3%
9	Foxworth sand, 0 to 5 percent slopes	A	6.0	0.4%
20	Pamlico muck, depressional	A/D	12.2	0.9%
21	Plummer and Surrency soils, depressional	A/D	22.3	1.5%
24	Ocilla loamy fine sand, 0 to 5 percent slopes	B/D	166.5	11.6%
33	Pelham sand	B/D	8.7	0.6%
34	Plummer sand	A/D	11.7	0.8%
35	Wahee fine sandy loam, 0 to 4 percent slopes, occasionally flooded	C/D	1.8	0.1%
36	Blanton fine sand, 0 to 5 percent slopes, occasionally flooded	A	8.9	0.6%
58	Sapelo sand	B/D	14.9	1.0%
62	Resota-Blanton-Bigbee complex, undulating, occasionally flooded	A	0.0	0.0%
Totals for Area of Interest			**1,438.2**	**100.0%**

Rating Options—Hydrologic Soil Group (Suwannee Ridge WEA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

11.17 Management Procedures Guidelines – Management of Archaeological and Historical Resources

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties
(revised June 2021)

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. Historic Property Definition

Historic properties include archaeological sites and historic structures as well as other types of resources. Chapter 267, Florida Statutes states: " '*Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state."*

B. Agency Responsibilities

Per Chapter 267, *F.S.* and state policy related to historic properties, state agencies of the executive branch must provide the Division of Historical Resources (Division) the opportunity to comment on any undertakings with the potential to affect historic properties that are listed, or eligible for listing, in the National Register of Historic Places, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the undertaking. (267.061(2)(a))

State agencies must consult with the Division when, as a result of state action or assistance, a historic property will be demolished or substantially altered in a way that will adversely affect the property. State agencies must take timely steps to consider feasible and prudent alternatives to the adverse effect. If no feasible or prudent alternatives exist, the state agency must take timely steps to avoid or mitigate the adverse effect. (267.061(2)(b))

State agencies must consult with Division to establish a program to locate, inventory and evaluate all historic properties under ownership or controlled by the agency. (267.061(2)(c))

State agencies are responsible for preserving historic properties under their control. State agencies are directed to use historic properties available to the agency when that use is consistent with the historic property and the agency's mission. State agencies are also directed to pursue preservation of historic properties to support their continued use. (267.061(2)(d))

C. Statutory Authority

The full text of Chapter 267, F.S. and additional information related to the treatment of historic properties is available at:

https://dos.myflorida.com/historical/preservation/compliance-and-review/regulations-guidelines/

D. Management Implementation

Although the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual and do not include detailed project information. Specific information for individual projects must be submitted to the Division for review and comment.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. The Division's recommendations may include, but are not limited to: approval of the project as submitted, recommendation for a cultural resource assessment survey by a qualified professional archaeologist, and modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions or alterations to historic structures as well as new construction must also be submitted to the Division for review. Projects involving structures fifty years of age or older must be submitted to the Division for a significance determination**.** In rare cases, structures under fifty years of age may be deemed historically significant.

Adverse effects to historic properties must be avoided when possible, and if avoidance is not possible, additional consultation with the Division is necessary to develop a mitigation plan. Furthermore, managers of state property should make preparations for locating and evaluating historic properties, both archaeological sites and historic structures.

E. Archaeological Resource Management (ARM) Training

The ARM Training Course introduces state land managers to the nature of archaeological resources, Florida archaeology, and the role of the Division in managing state-owned archaeological resources. Participants gain a better understanding of the requirements of state and federal laws with regard to protecting and managing archaeological sites on state managed lands. Participants also receive a certificate recognizing their ability to conduct limited monitoring

activities in accordance with the Division's Review Procedure, thereby reducing the time and money spent to comply with state regulations. Additional information regarding the ARM Training Course is available at:

https://dos.myflorida.com/historical/archaeology/education/arm-training-courses/

F. Matrix for Ground Disturbance on State Lands

The matrix is a tool designed to help streamline the Division's Review Procedure. The matrix allows state land managers to make decisions about balancing ground disturbance and stewardship of historic resources. The matrix establishes types of undertakings that are either minor or major disturbances and then guides the land manager to consult the Division, conduct ARM-trained project monitoring, or proceed with the project. Additional information regarding the matrix is available at:

https://dos.myflorida.com/historical/archaeology/education/dhr-matrix-for-ground-disturbance-on-state-lands/

G. Human Remains Treatment

Chapter 872, *Florida Statutes* makes it illegal to willfully and knowingly disturb human remains. In the event human remains are discovered, cease all activity in the area that may disturb the remains. Leave the bones and nearby items in place. Immediately notify law enforcement or the local district medical examiner of the discovery and follow the provisions of Chapter 872, FS. Additional information regarding the treatment of human remains and cemeteries is available at:

https://dos.myflorida.com/historical/archaeology/human-remains/
https://dos.myflorida.com/historical/archaeology/human-remains/abandoned-cemeteries/what-are-the-applicable-laws-and-regulations/

H. Division of Historical Resources Review Procedure

Projects on state owned or controlled properties may submit projects to the Division for review using the streamlined State Lands Consultation Form. The form provides instructions to submit projects for review and outlines the necessary information for the Division to complete the review process. The State Lands Consultation Form and additional information about the Division's review process is available at:

https://dos.myflorida.com/historical/preservation/compliance-and-review/state-lands-review/

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Compliance and Review Section
Bureau of Historic Preservation
Division of Historical Resources
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

StateLandsCompliance@dos.myflorida.com

Phone: (850) 245-6333
Toll Free: (800) 847-7278
Fax: (850) 245-6435

11.18 Land Management Uniform Accounting Council Categories

Land Management Uniform Cost Accounting Council and FWC Activity Code Groupings

Resource Management

Invasive and Nuisance Species Control

210 Invasive and nuisance species control

211 Invasive and nuisance plant control (mechanical)

212 Invasive and nuisance plant control (chemical)

Prescribed Burning

205 Prescribed burning

206 Prescribed burning C growing season (April 1 to September 30)

207 Prescribed burning C dormant season (October 1 to March 31)

208 Firebreaks

Cultural Resource Management

201 Cultural resource management

Timber Management

202 Timber management

Hydrological Management

194 Lake restoration

215 Hydrology management

216 Dams, dikes, levees

217 Canals

218 Water level management

Other

185 GIS

200 RESOURCE MANAGEMENT

203 Tree and shrub planting

213 Wildlife management

214 Listed Species management

219 Upland restoration

221 Animal surveys

228 Inland aerial surveys

235 Vegetation and plant surveys

250 MONITORING AND ASSESSMENTS

252 Biomedical monitoring

253 Ecological monitoring

256 Habitat monitoring analysis

263 Nest box monitoring

264 Population demographics

275 Permits and authorizations

276 Commission rule development and review

281 Technical assistance

282 Herbaceous seeding

283 Clearings

284 Feeding/watering

285 Nest structures

286 Population control

287 Stocking enhancements/population augmentation

288 Nuisance animal complaints 282 Herbaceous seeding

289 Native vegetation management (mechanical)

290 Native vegetation management (chemical)

293 Mortality investigations

294 Program coordination and implementation C inter- and intra-agency coordination and program implementation at the section, bureau, or division level

295 Biological data collection, analysis, and reporting

296 Habitat protection technical assistance

750 URTD assessment

789 Site Preparation – GCR

790 Irrigation – GCR

791 Seed Collection – Hand

792 Seed Collection – Mechanical

793 Herbicide Maintenance Treatment

Administration

Central Office/Headquarters

100 ADMINISTRATION C administrative tasks, including preparation of forms, word processing, photocopying, filing, and other clerical/secretarial duties.

104 Budget/purchasing/accounting

Districts/Regions

See Location code

Units/Projects

See Location code

Support

Land Management Planning

103 Meetings C includes workshops, conferences, staff, and other meetings.

204 Resource Planning

Land Management Reviews

101 Project inspection C field inspections of projects.

209 Land Management Reviews

Training/Staff Development

150 PERSONNEL MANAGEMENT C recruitment, hiring, training, counseling, and supervising.

Vehicle Purchase

128 New Vehicle and Equipment Purchase

Vehicle Operation and Maintenance

923 FEM C vehicles/equipment

Other

140 REPORT WRITING/EDITING/MANUSCRIPT PREPARATION

141 Grant applications

180 SYSTEMS ADMINISTRATION AND MANAGEMENT

182 Data management

184 Metadata development and management

187 IT

188 Web development

226 Human dimensions surveys

721 Geospatial analysis techniques

Capital Improvements

New Facility Construction

910 New facility construction C buildings/structures

912 New construction C roads/bridges

913 New construction C trails

914 New construction C fences

Facility Maintenance

920 Facility and equipment maintenance (FEM) C buildings/structures

921 FEM C utilities

922 FEM C custodial functions

925 FEM C boating access

926 FEM C roads/bridges

927 FEM C trails

928 FEM C fences

Visitor Services/Recreation

Information/Education Programs

145 Technical bulletin

Operations

311 Boundary signs

312 Informational signs

320 Outreach and education C attending or developing educational or informational materials or events for the public

341 Public use administration (hunting)

342 Public use administration (non-hunting)

350 Customer service support C disseminating written or verbal information or assistance to the public

700 STUDIES

740 EVALUATIONS AND ASSESSMENTS

11.19 Operational Plan Fiscal Year 2024-2025

Species	Activity	Man Days	Salary	Fuel Cost	Other	Total	Units	NFR	Accomplishments
9200-All wildlife	101-Project inspection	1.38	$573.92	$13.32	$0.00	$587.24			Evaluated ongoing projects for progress and completion.
9200-All wildlife	104-Budget/purchasing/accounting	0.13	$55.74	$1.21	$0.00	$56.95			Maintained and monitored P-card expenditures and budget reports.
9200-All wildlife	182-Data management	0	$0.00	$108.41	$2,343.32	$2,451.73			Compiled, organized and electronically filed data records. Provided salary for OPS personnel.
9200-All wildlife	185-GIS	0.25	$58.86	$35.13	$213.32	$307.31			Compiled shape-files, produced maps, and entered treatment data into Land Management Information System. Provided salary for OPS personnel.
9200-All wildlife	200-Resource Management	0	$0.00	$0.00	$300.00	$300.00			Provided payment for administrative lease fee to Division of State Lands
9200-All wildlife	201-Cultural resource management	0.81	$164.09	$7.87	$0.00	$171.96	12		Performed annual monitoring of twelve identified cultural resource sites. Coordinated with Public Land Archaeology, Department of Historical Resources regarding Cultural Resources Reconnaissance Surveys of the area.
9200-All wildlife	203-Tree and shrub planting	1.5	$366.89	$14.54	$0.00	$381.43			Procured longleaf pine seedlings for FY 24-25 planting season.
9200-All wildlife	204-Resource planning	0.25	$56.48	$2.42	$0.00	$58.90			Returned phone calls and emails, completed general administration, planning, project development and evaluation; communicated with and supervised contractors, and made general expenditures.
9200-All wildlife	206-Prescribed burning - growing season	11.75	$3,166.30	$235.89	$1,984.39	$5,386.58	266		Completed planning activities and purchased supplies for growing season prescribed burns. Completed growing season prescribed burns of 266 acres. Provided salary for OPS personnel.
9200-All wildlife	207-Prescribed burning - dormant season	8.75	$2,247.48	$84.79	$0.00	$2,332.27	30		Completed dormant season prescribed burns on 30 acres.
9200-All wildlife	208-Firebreaks	0.81	$225.66	$133.24	$876.75	$1,235.65	20		Maintained 20 miles of fire-breaks. Provided salary for OPS personnel.
9200-All wildlife	210-Exotic species control	3.75	$871.26	$156.25	$858.92	$1,886.43	2		Monitored for exotic plant species. Identified and treated 2 acres of showy and lance-leaf crotalaria, Japanese climbing fern, chinaberry, mimosa, sweet tanglehead grass, cogon grass, and hairy indigo. Purchased herbicide and provided salary for OPS personnel.
9200-All wildlife	221-Animal surveys	4.06	$961.00	$144.14	$2,459.53	$3,564.67	2		Collected incidental observations of common and locally important species. Conducted camera trap survey for meso-mammals and wetlands survey with funnel traps for inventory monitoring. Entered observations and survey data into the Survey and Monitoring Protocol system. Provided salary for OPS personnel.
9200-All wildlife	263-Nest box monitoring	1	$299.11	$9.69	$0.00	$308.80	6		Maintained and monitored six nest boxes for Wood Ducks.
9200-All wildlife	289-Native vegetation management (mechanical)	7.75	$2,247.62	$75.10	$0.00	$2,322.72	13		Mowed 13 acres of brush and hurricane debris.
9200-All wildlife	290-Native vegetation management (chemical)	3.19	$936.52	$30.89	$10,867.13	$11,834.54	70		Procured contractual services to perform chemical application services on 70 acres of dense understory hardwoods to reduce hardwoods, under-story shading, and competition with native grasses and pines. Provided salary for OPS personnel.
9200-All wildlife	923-FEM -- vehicles/equipment	2.13	$459.05	$20.59	$0.00	$479.64			Repaired, serviced, and maintained vehicles and equipment.
9200-All wildlife	926-FEM -- roads/bridges	17.31	$4,248.81	$468.75	$41,991.06	$46,708.62	19		Maintained 19 miles of roads. Maintained public parking area. Purchased limerock road base material and provided salary for OPS personnel.
9200-All wildlife	927-FEM -- trails	7	$1,693.32	$88.42	$381.51	$2,163.25	1		Mowed and maintained one-mile hiking trail. Provided salary for OPS personnel.
9200-All wildlife	928-FEM -- fences	1.75	$272.22	$16.96	$0.00	$289.18	5		Maintained five miles of boundary fences.
9270-Nongame wildlife (other)	221-Animal surveys	0	$0.00	$4.24	$94.92	$99.16			Purchased supplies for mesomammal survey.
9283-unknown species	200-Resource Management	1.25	$414.39	$12.11	$0.00	$426.50			Completed general project administration, planning, project development and evaluation, coordinated communication with and provided supervision of contractors.
		74.82	$19,318.72	$1,663.96	$62,370.85	$83,353.53			

11.20 Arthropod Control Plan

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

Section 388.4111, F.S.
Telephone: (850) 617-7995

Return to:
Mosquito Control Program
3125 Conner Blvd., Bldg. 6,
Tallahassee, FL 32399-1650

WILTON SIMPSON
COMMISSIONER

For use in documenting an Arthropod Control Plan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein. Fill this form out if control work is necessary or planned.

Name of Designated Land: Suwannee Ridge Wildlife and Environmental Area (WEA)

Is Control Work Necessary: ☐ Yes ☑ No

Location: Suwannee Ridge WEA, 7691 SW 67th Dr. (CR 249), Jasper, FL 32052

Land Management Agency: Florida Fish and Wildlife Conservation Commission

Are Arthropod Surveillance Activities Necessary? ☐ Yes ☑ No
If "Yes", please explain:

Which Surveillance Techniques Are Proposed?
Please Check All That Apply:

❑ Landing Rate Counts	❑ Light Traps	❑ Sentinel Chickens
❑ Citizen Complaints	❑ Larval Dips	❑ Other

If "Other", please explain: N/A

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Arthropod Species for Which Control is Proposed: N/A

Proposed Larval Control: N/A

Proposed larval monitoring procedure: N/A

Are post treatment counts being obtained: ☐ Yes ☑ No

Biological Control of Larvae: N/A

Might predacious fish be stocked: ☐ Yes ☑ No

Other biological controls that might be used:

Material to be Used for Larvaciding Applications: N/A

(Please Check All That Apply:)

- ☐ Bti
- ☐ Bs
- ☐ Methoprene
- ☐ Non-Petroleum Surface Film
- ☐ Other, please specify:

Please specify the following for each larvacide:

Chemical or Common name: N/A

☐ Ground ☐ Aerial

Rate of application: N/A

Method of application: N/A

Proposed Adult Mosquito Control:

Aerial adulticiding ☐ Yes ☑ No

Ground adulticiding ☐ Yes ☑ No

Please specify the following for each adulticide:

Chemical or common name: N/A

Rate of application: N/A

Method of application: N/A

Proposed Modifications for Public Health Emergency Control: Arthropod control agency may request special exception to this plan during a threat to public or animal health declared by State Health Officer or Commissioner of Agriculture.

Proposed Notification Procedure for Control Activities:

Records:

Are records being kept in accordance with Chapter 388, F.S.:

☑ Yes ☐ No

Records Location: Under lock and key in Hamilton County Emergency Operations Center

How long are records maintained: Records have been kept on file permanently

Vegetation Modification:

What trimming or altering of vegetation to conduct surveillance or treatment is proposed? N/A

Proposed Land Modifications:

Is any land modification, i.e., rotary ditching, proposed: N/A

Include proposed operational schedules for water fluctuations: N/A

List any periodic restrictions, as applicable, for example peak fish spawning times.
N/A

Proposed Modification of Aquatic Vegetation: N/A

Land Manager Comments:

Arthropod Control Agency Comments:

James C Conner III

Digitally signed by James C Conner III
Date: 2025.05.23 12:49:35 -04'00'

Signature of Lands Manager or Representative Date

5-21-25

Signature of Mosquito Control Director / Manager Date

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11.21 Hamilton County Letter of Compliance with Local Government Comprehensive Plan

JIMMY MURPHY
DISTRICT 1
ROBBIE ROBERSON
DISTRICT 2
JAMES HOWELL
DISTRICT 3
TRAVIS ERIXTON
DISTRICT 4
RICHIE MCCOY
DISTRICT 5

ANDY DECKER
COUNTY ATTORNEY
GREG GODWIN
CLERK OF COURTS

May 2, 2025

Cedar Spirk, Land Conservation Planner
Florida Fish and Wildlife Conservation Commission
620 S. Meridian Street
Tallahassee, FL 32399
RE: Review of Draft Copy of Suwannee Ridge WEA Management Plan

Dear Cedar,

Thank you for providing Hamilton County with the opportunity to review the draft of the Florida Fish and Wildlife Conservation Commission's Ten-Year Land Management Plan (2025-2035) for Suwannee Ridge Wildlife and Environmental Area. The draft plan is very thorough and well-written and is in compliance with the goals, objectives and policies of the Hamilton County Comprehensive Plan. If you have any further needs, please contact me at (386)792-0507 or landuse@hamitloncountyfl.com.

Sincerely,

Matthew Morgan
Land Use Administrator
Hamilton County, Florida