

2026-2036

AUCILLA WILDLIFE MANAGEMENT AREA

10-YEAR MANAGEMENT PLAN
JEFFERSON AND TAYLOR COUNTIES



**FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION**

620 SOUTH MERIDIAN STREET
TALLAHASSEE, FL 32399-1600



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PENDING APPROVAL LETTER**

Aucilla Wildlife Management Area Management Plan

Jefferson and Taylor Counties

Owned by the Board of Trustees of the Internal Improvement Trust Fund

Managed by the Florida Fish and Wildlife Conservation Commission



June 2026

Approved _____
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: Aucilla Wildlife Management Area (AWMA)

Location: Jefferson and Taylor counties, Florida

Acreage Total: 44,457 acres

Acreage Breakdown:

<u>Landcover Classification</u>	<u>Acres*</u>	<u>Percent of Total Area</u>
Artificial Pond	64.14	0.14%
Basin Swamp	7,462.35	16.45%
Baygall	3,059.38	6.74%
Depression Marsh	39.28	0.09%
Developed	11.82	0.03%
Dome Swamp	898.11	1.98%
Firebreak	18.70	0.04%
Floodplain Swamp	646.34	1.42%
Hydric Hammock	15,919.32	35.08%
Linear Feature	0.67	<0.01%
Mesic Flatwoods	421.55	0.93%
Mesic Hammock	1,640.78	3.62%
Pasture - Improved	3.98	0.01%
Pine Plantation	1,223.77	2.70%
Restoration Mesic Flatwoods	6,974.41	15.37%
Restoration Mesic Hammock	204.22	0.45%
Restoration Sandhill	50.00	0.11%
Restoration Scrubby Flatwoods	19.03	0.04%
Restoration Upland Hardwood Forest	5.80	0.01%
Restoration Wet Flatwoods	4,793.61	10.56%
Restoration Wet Prairie	45.68	0.10%
Road	593.36	1.31%
Scrubby Flatwoods	2.34	0.01%

**GIS-calculated acreage for landcover classification varies slightly from actual total acreage.*

Lease/Management Agreement No.: 3590

Use: Single Management Responsibilities:

Multiple X

Agency FWC

Responsibilities

LEAD, LESSEE (Wildlife Management Area, resource protection, law enforcement)

Designated Land Use: Wildlife Management Area

Sublease (s): None

Encumbrances: Two access easements; one utility easement with Progress Energy, Inc.; one conveyance deed between St. Joe Paper Company and Florida Power Corporation; four Apiary Agreements; and one Memorandum of Agreement with the Florida Trail Association

Type Acquisition: Conservation and Recreation Lands, Preservation 2000, and Florida Forever programs.

Unique Features: Natural communities include basin swamp, baygall, depression marsh, dome swamp, floodplain swamp, hydric hammock, mesic flatwoods, mesic hammock, and scrubby flatwoods

Archaeological/Historical: 331 documented within the AWMA

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: 42,121 acres on the FWC Additions and Inholdings list (Figure 15)

Surplus Lands/Acreage: None

Public Involvement: Management Advisory Group consensus building meeting and Public Hearing
(Appendix 11.4)

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	10, 11
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	10, 11
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	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	5, 6, 29
6	An assessment as to whether the property, or any portion, should be declared surplus. <i>Provide Information regarding assessment and analysis in the plan, and provide corresponding map.</i>	18-2.021	32
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. <i>Please clearly indicate parcels on a map.</i>	18-2.021	48-51
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	30
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)	11, 32, 54-58
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	2-4, 8, 23-25

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	30, 31
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	26, 27
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	30-32
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	10
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	26, 34, 45, 52, 56
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	10, 52
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)	11, 27, 30-32
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	62

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	Appendix 11.23
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	30, 34, 43, 44, 54-58
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	30-32
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	44, 45, 56, Appendix 11.17
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	31, 32

*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	13, Appendices 11.4 and 11.5
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)	Appendix 11.5
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. <i>Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.</i>	259.032(10)	Appendix 11.4
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	Appendix 11.4.1
28	During plan development, at least one public hearing shall be held in each affected county. Notice of such public hearing shall 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. <i>Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.</i>	253.034(5) & 259.032(10)	Appendix 11.5
29	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-	259.036	32, 33, Appendix 11.13

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
	year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>		
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	Appendix 11.13
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 11.13

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. <i>Use brief descriptions and include USDA maps when available.</i>	18-2.021	14, 15, Appendix 11.6
33	Insert FNAI based natural community maps when available.	ARC consensus	17, 18
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	13, 14, 16-18, Appendix 11.7
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	23-26
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	26
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	26
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	21-23, 37-39
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	19-22, 35-39, Appendices 11.7, 11.9, and 11.15
40	The identification or resources on the property that are listed in the Natural Areas Inventory. <i>Include letter from FNAI or consultant where appropriate.</i>	18-2.021	19,-23, Appendix 11.10
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)	54-58, Appendices 11.7, 11.9, 11.12, 11.15
42	Habitat Restoration and Improvement	259.032(10) & 253.034(5)	
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.	↓	33-42, 44, 45, 54-58
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.	↓	54-58
42-C.	The associated measurable objectives to achieve the goals.	↓	54-58
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include</i>	↓	58, Appendices 11.14-11.17

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
	<i>fire management plans - they can be in plan body or an appendix.</i>		
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.		60, 61
43	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. <i>See footnote.</i>	253.034(5)	26, 35-37, 44, 45, 56, 58, Appendix 11.17
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).	↓	26, 35-37, 44, 45, 58, Appendix 11.17
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	56
44-C.	Measurable objectives (see requirement for #42-C).	↓	56
44-D.	Related activities (see requirement for #42-D).	↓	26, 35-37, 44, 45, 58, Appendix 11.17
44-E.	Budgets (see requirement for #42-E).		60, 61
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).	↓	19, 21-23, 37-39, 54, 58, Appendices 11.9 and 11.15
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	54
45-C.	Measurable objectives (see requirement for #42-C).	↓	54
45-D.	Related activities (see requirement for #42-D).	↓	19, 21-23, 37-39, 60, Appendices 11.9 and 11.15
45-E.	Budgets (see requirement for #42-E).		60, 61
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	22
45-G	Economic feasibility of establishing a gopher tortoise recipient site, including the initial cost, recurring management costs and the revenue projections.	259.105	22
46	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. <i>See footnote.</i>	253.034(5)	20-22, 39-42, 55, 58, Appendix 11.7
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 11.22
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).	↓	20-22, 39-42, 58, Appendix 11.7
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	55
48-C.	Measurable objectives (see requirement for #42-C).	↓	55
48-D.	Related activities (see requirement for #42-D).	↓	20-22, 39-42, 58, Appendix 11.7
48-E.	Budgets (see requirement for #42-E).		60, 61

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. <i>If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.</i>	18-2.018 & 18-2.021	23-25
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	23-25
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	16-18, 23-25, 26, Appendix 11.7
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	16-18, 23-25, 56, Appendices 11.7 and 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).	↓	16-18, 23-25, Appendices 11.7 and 11.16
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	56
53-C.	Measurable objectives (see requirement for #42-C).	↓	56
53-D.	Related activities (see requirement for #42-D).	↓	16-18, 23-25, Appendices 11.7 and 11.16
53-E.	Budgets (see requirement for #42-E).		60, 61

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. <i>Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.</i>	18-2.018, 18-2.021 & per DHR's request	26, 45, Appendix 11.12
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	26, 45, Appendix 11.12
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	26, 45, 56, Appendices 11.12 and 11.18
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).	↓	26, 45, Appendices 11.12 and 11.18
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	56
57-C.	Measurable objectives (see requirement for #42-C).	↓	56
57-D.	Related activities (see requirement for #42-D).	↓	26, 45, Appendices 11.12 and 11.18
57-E.	Budgets (see requirement for #42-E).		60, 61

**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 <i>footnote</i> .	253.034(5)	27-29, 42-46, 55-57
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).	↓	27-29, 42-46
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	55-57
59-C.	Measurable objectives (see requirement for #42-C).	↓	55-57
59-D.	Related activities (see requirement for #42-D).	↓	27-29, 42-46
59-E.	Budgets (see requirement for #42-E).		60, 61
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	27-29, 42-46, 55-57
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).	↓	27-29, 42-46
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).	↓	55-57
61-C.	Measurable objectives (see requirement for #42-C).	↓	55-57
61-D.	Related activities (see requirement for #42-D).	↓	27-29, 42-46
61-E.	Budgets (see requirement for #42-E).		60, 61

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	iii-ix
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	i, ii
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	37-53
65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	54-58
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)	60, 61, Appendices 11.20 and 11.21
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	259.032(10)	60, 61, Appendices 11.20 and 11.21

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
	recommendations for cost-effective methods in accomplishing those activities.		
68	A statement of gross income generated, net income and expenses.	18-2.018	30, 60, 61, Appendices 11.20 and 11.21

*** = 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
ARSA	Apalachicola Regional Stewardship Alliance
AWMA	Aucilla Wildlife Management Area
DEP	Department of Environmental Protection
DHR	Department of Historical Resources
DSL	Division of State Lands
F.A.C.	Florida Administrative Code
F.S.	Florida Statutes
FDACS	Florida Department of Agriculture and Consumer Services
FFS	Florida Forest Service
FISC	Florida Invasive Species Council
FLAM	Florida Landscape Assessment Model
FMSF	Florida Master Site File
FNAI	Florida Natural Areas Inventory
FNST	Florida National Scenic Trail
FTA	Florida Trail Association
FWC	Florida Fish and Wildlife Conservation Commission
GIS	Geographic Information Systems
LAP	Landowner Assistance Program
MAG	Management Advisory Group
MOA	Memorandum of Agreement
NRCS	Natural Resources Conservation Service
OBVM	Objective-Based Vegetation Management
P2000	Preservation 2000
SJPC	St. Joe Paper Company
SRWMD	Suwannee River Water Management District
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
WCPR	Wildlife Conservation Prioritization and Recovery
WMA	Wildlife Management Area

1 Introduction and General Information

Along Florida's Nature Coast, the Aucilla Wildlife Management Area (AWMA) conserves approximately 50,524 acres of wildlife habitat and is part of a nearly unbroken corridor of public conservation lands spanning from the St. Marks River to the Suwannee River (Figures 1-4). The Aucilla River Sinks section of the Aucilla River and a portion of the Wacissa River can be found meandering throughout the wildlife-rich pine flatwoods and hardwood swamps of the AWMA. The area provides important watershed and water quality protection, as well as a rich diversity of habitats for imperiled species, significant cultural resources, unique geological features, and more.

The AWMA can be found within the interior of Jefferson County as well as the western portion of Taylor County. The area is owned by the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees) and the Suwannee River Water Management District (SRWMD). The Florida Fish and Wildlife Conservation Commission (FWC) has lead management authority for the 44,457 acres owned by the Board of Trustees and maintains a cooperative management agreement with the SRWMD for the remaining 6,067 acres. This Management Plan only pertains to the portions of the AWMA in which the FWC has lead management authority (Figure 5).

This Management Plan has been developed in conformance with the requirements of Section 259.032, Florida Statutes (F.S.) and is proposed for submittal to the Board of Trustees and the Acquisition and Restoration Council (ARC) through the Florida Department of Environmental Protection's (DEP) Division of State Lands (DSL) pursuant to the requirements of Chapters 253 and 259, F.S., and Chapters 18-2 and 18-4, Florida Administrative Code (F.A.C.). The format and content were drafted in accordance with ARC requirements for management plans, and the model plan outline was provided by the staff of the DSL. Terms (Appendix 11.1) used in this Management Plan describing management activities conform to those developed for the Land Management Uniform Accounting Council Biennial Land Management Operational Report.

1.1 Location

The AWMA is in north Florida in Jefferson and Taylor counties, and the lead managed portion of the area encompasses approximately 44,457 acres (Figures 1 and 2). The AWMA lies in all or parts of (Figure 3):

- Sections 1-3, 9-17, 20-29, and 33-36 in Township 2 South, Range 3 East;
- Sections 4-9, 16-20, and 29-31 in Township 2 South, Range 4 East;
- Sections 1-5, 8-17, 20-29, and 33-36 in Township 3 South, Range 3 East;
- Sections 6-8, 17-19, 21, 22, and 27-33 in Township 3 South, Range 4 East;
- Sections 1-4, 9-11, 15-17, 21, and 22 in Township 4 South, Range 3 East; and,
- Sections 4-6 in Township 4 South, Range 4 East.

The city of Tallahassee is 15 miles northwest of the Wacissa headwaters at the north end of the AWMA. From the Western Sloughs entrance, the town of Perry is 27 miles east, and the town of

Woodville is 15 miles west. State Road 59 runs along its western boundary. The AWMA is not located within a designated Area of Critical State Concern.

1.1.1 Proximity to other Public Conservation Lands

The AWMA is in the vicinity of an extensive network of conservation lands, including lands managed by the Florida Forest Service (FFS), Tall Timbers Research Inc., the SRWMD, the DEP, Jefferson County, and others. Federally owned properties in the vicinity of the area include the St. Marks National Wildlife Refuge, the Gum Swamp Research Natural Area, and a Farm Service Agency (FSA) Conservation Easement. Several Florida Forever projects are also located in the vicinity of the area (Figure 4).

Tables 1 and 2 list the Florida Forever projects and conservation lands within a 10-mile radius of the AWMA, 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 10-mile Vicinity

Project Name	GIS Acres
Aucilla/Wacissa Watershed	40,180
Avalon	2,957
Florida's First Magnitude Springs	6,916
St. Joe Timberland	45,330
St. Marks River Basin	4,711

Table 2. Conservation Lands within a 10-mile Vicinity

Federal Government	Managing Agency
FSA Conservation Easement - Tract 28C	USFWS
Gum Swamp Research Natural Area	USFWS
St. Marks National Wildlife Refuge	USFWS
State of Florida	
St. Marks Crossing Agricultural and Conservation Easement	FDACS
Plank Road State Forest	FFS
Econfina River State Park	DEP-DRP
Natural Bridge Battlefield Historic State Park	DEP-DRP
San Marcos de Apalache Historic State Park	DEP-DRP
St. Marks River Preserve State Park	DEP-DRP
Tallahassee-St. Marks Historic Railroad Trail State Park	DEP-DRP

Avalon Plantation Conservation Easement #1	DEP-DSL
Avalon Plantation Conservation Easement #2	DEP-DSL
Avalon Plantation Conservation Easement #3	DEP-DSL
Avalon Plantation Conservation Easement #4	DEP-DSL
Kiser Conservation Easement	DEP-DSL
Letchworth Mounds Conservation Easement	DEP-DSL
Floyd's Mound	DEP-DHR
Big Bend Wildlife Management Area	FWC
L. Kirk Edwards Wildlife and Environmental Area	FWC

Water Management District

Blueprint 2000 Conservation Easement	NWFWMD
Gerrell Conservation Easement	NWFWMD
Davidson Conservation Easement	SRWMD
Donald Bailey Conservation Easement	SRWMD
Econfina Conservation Area	SRWMD
Lower Aucilla Conservation Easement	SRWMD
Middle Aucilla Conservation Area	SRWMD
Moore Conservation Easement	SRWMD
Mount Gilead Conservation Easement	SRWMD
Wacissa Conservation Area	SRWMD
Walker Spring Conservation Easement	SRWMD
Whit Foster Conservation Easement	SRWMD

County/City

Headwaters of the Wacissa River	Jefferson County
St. Marks Headwaters	Leon County

Private/Public Conservation Organization

Wetlands America Trust Preserve	Ducks Unlimited
Caney Branch Preserve	Putnam Land Conservancy, Inc.
Big Bend Wildlands Preserve Conservation Easement	Tall Timbers Research, Inc.
Crow Pond Conservation Easement	Tall Timbers Research, Inc.
Lick Skillet Conservation Easements	Tall Timbers Research, Inc.
Oak Hill Conservation Easements	Tall Timbers Research, Inc.
Three Creeks Ranch Conservation Easement	Tall Timbers Research, Inc.
Avalon Plantation Conservation Easement	The Nature Conservancy
Turkey Scratch Plantation Conservation Easement	The Nature Conservancy
St. Marks Mitigation Bank	Westervelt Ecological Services

Acronym Key	Agency Name
DEP-DRP	Florida Department of Environmental Protection - Division of Recreation and Parks
DEP-DSL	Florida Department of Environmental Protection - Division of State Lands
DEP-DHR	Florida Department of Environmental Protection - Division of Historical Resources
FDACS	FL Dept. of Agriculture and Consumer Services
FFS	Florida Forest Service

FWC	Fish and Wildlife Conservation Commission
NWFWMD	Northwest Florida Water Management District
SRWMD	Suwannee River Water Management District
USFWS	U.S. Dept. of the Interior, Fish and Wildlife Service

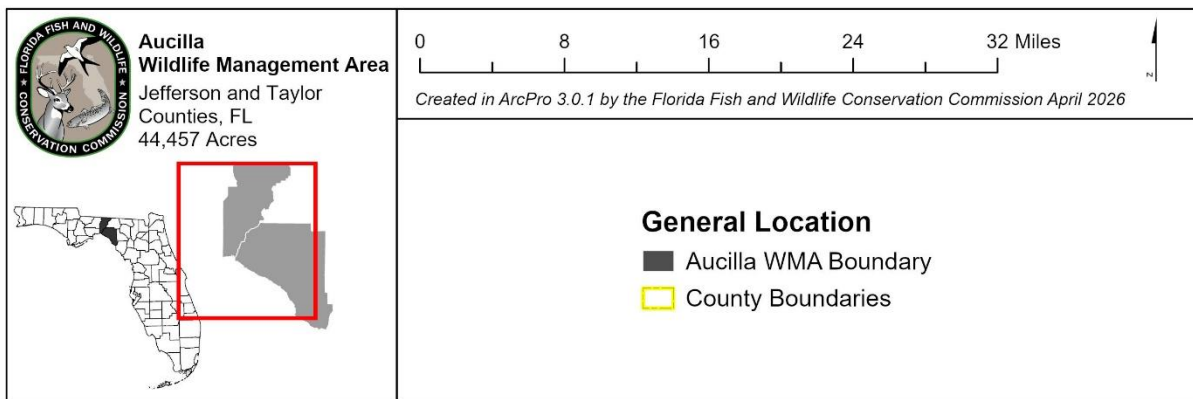
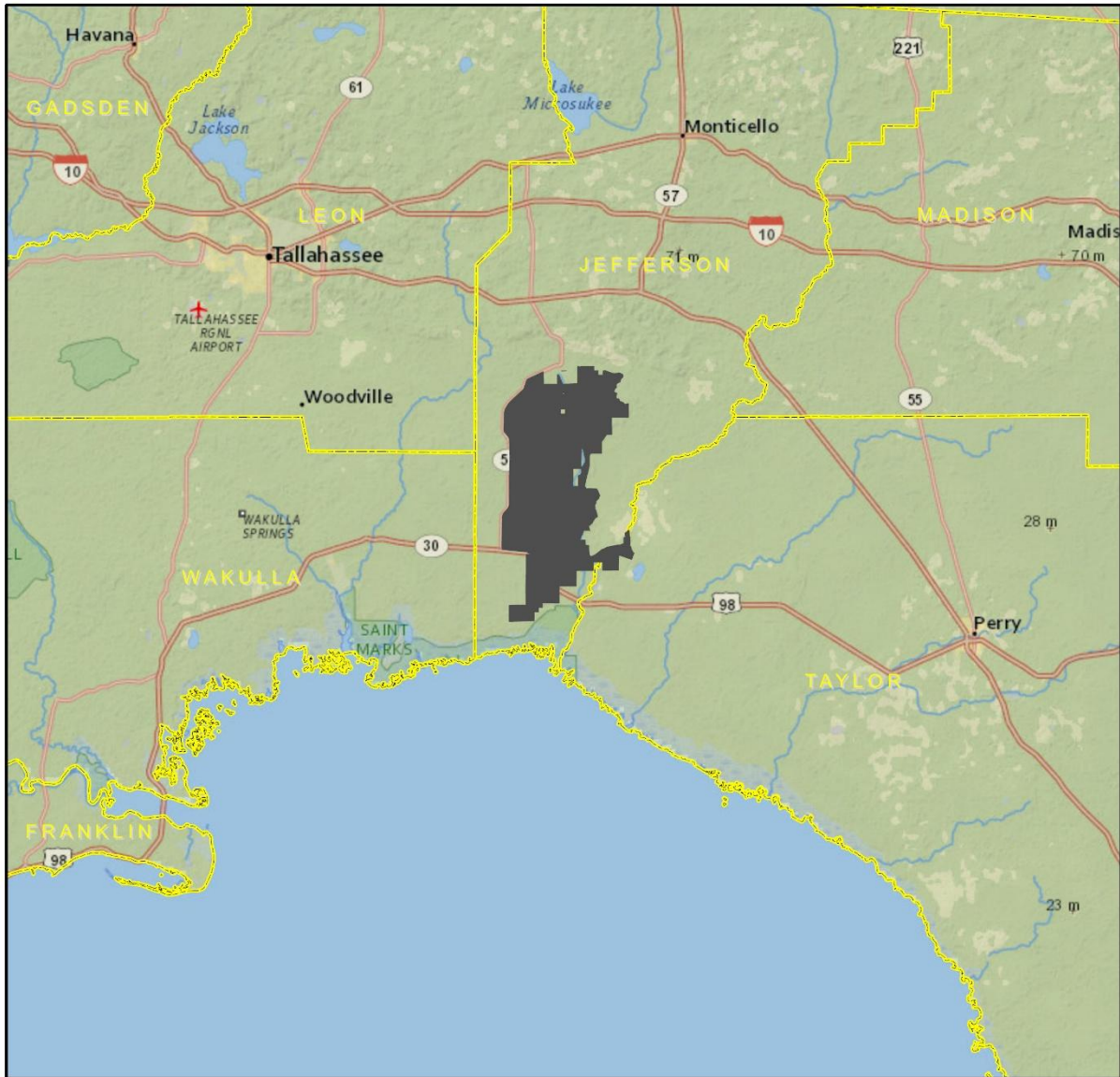


Figure 1. General Location

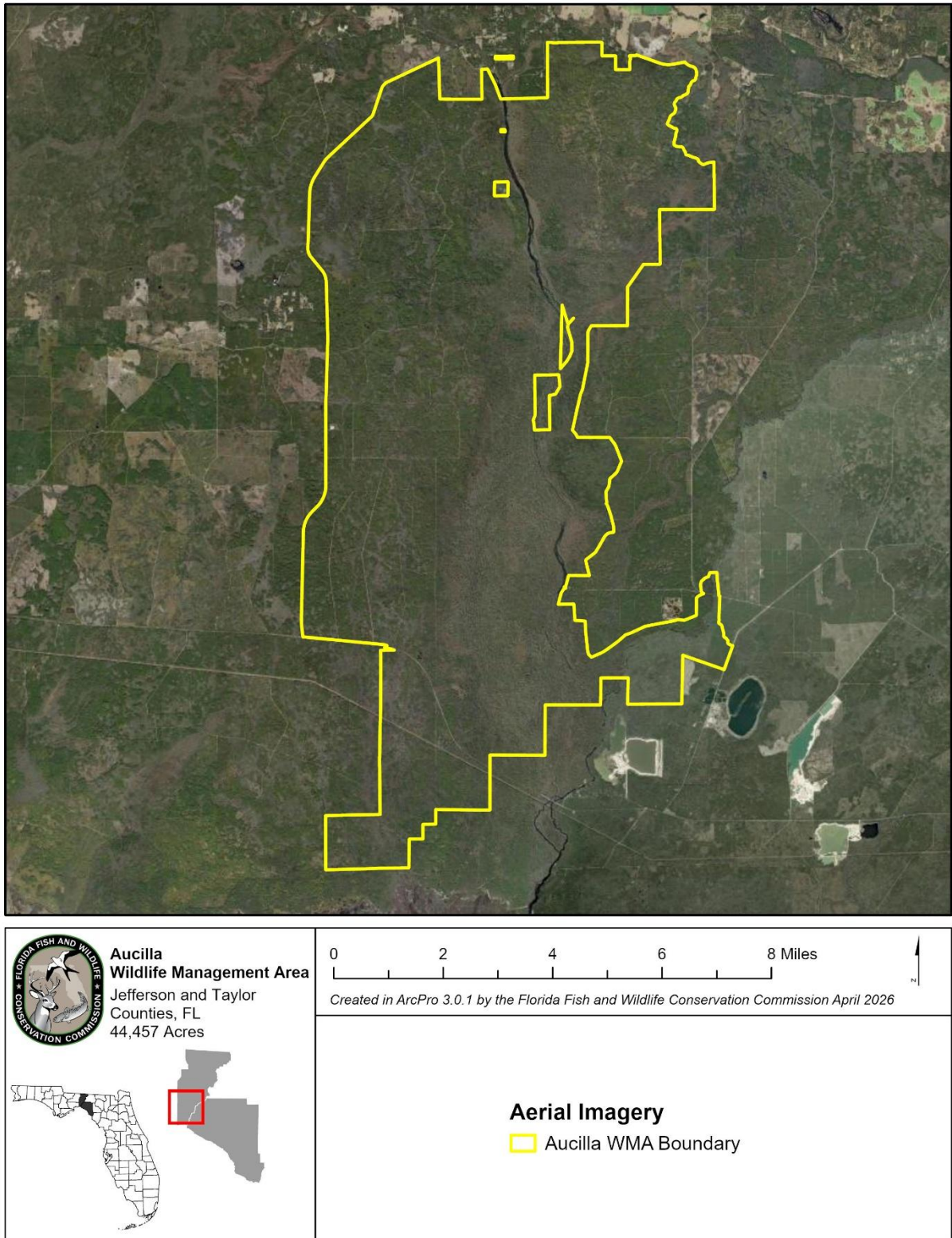


Figure 2. Aerial Imagery

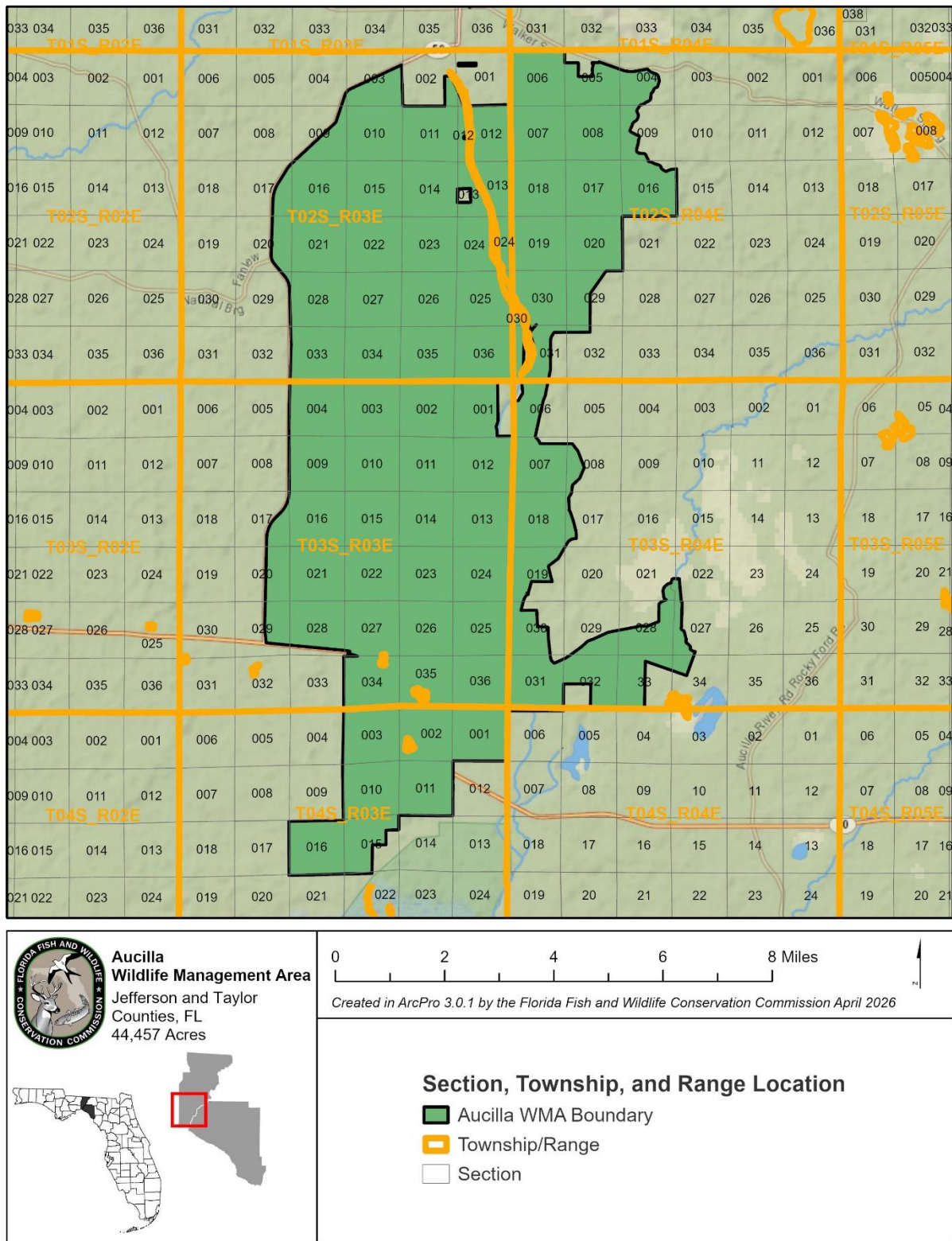


Figure 3. Section, Township, and Range Location

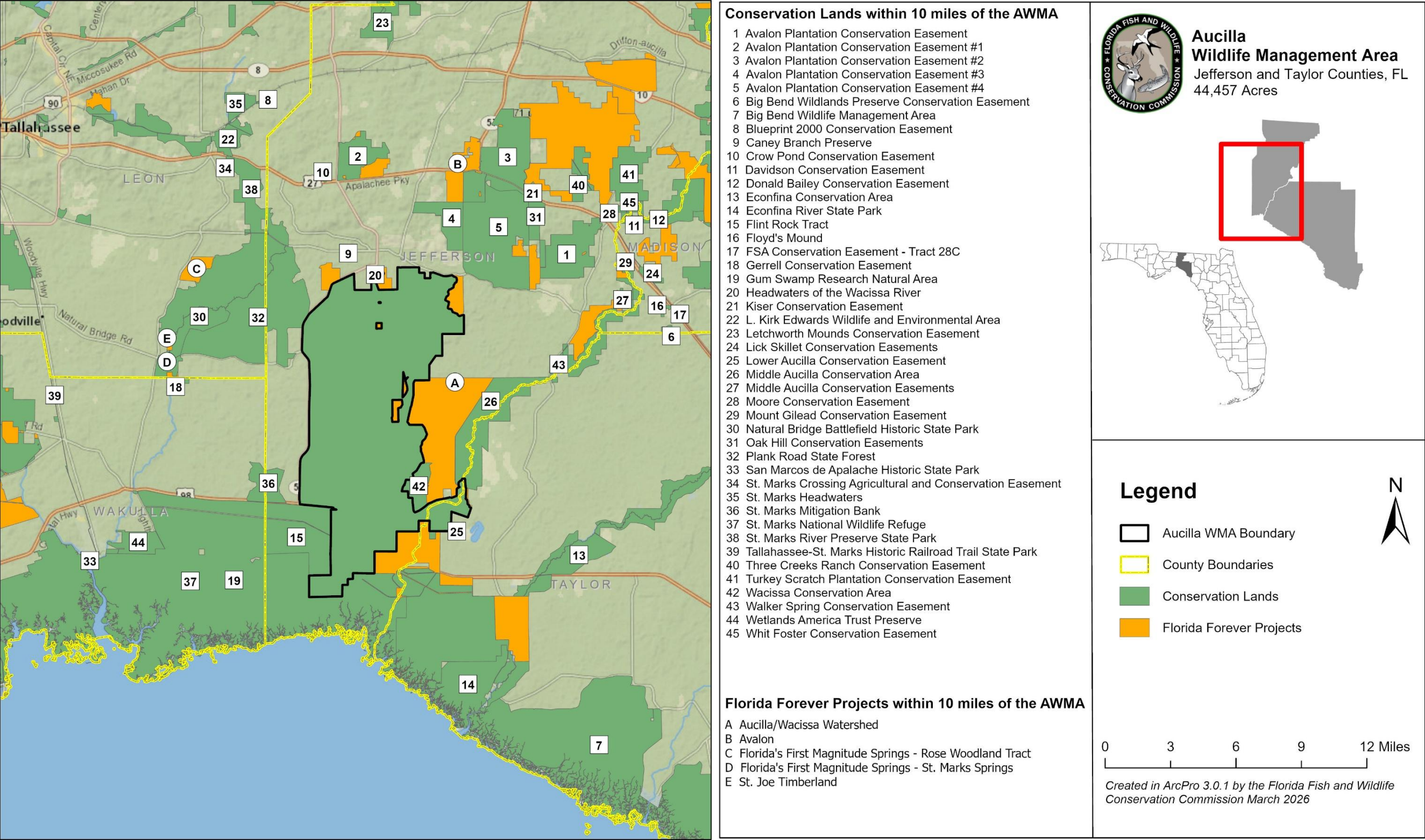


Figure 4. Nearby Conservation Lands and Florida Forever Projects

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1.2 Title Interest and Management Authority

As State-owned lands, title to a majority of the AWMA is vested in the Board of Trustees. In 1988, the DSL entered a 50-year multiple agency lease agreement (Lease Agreement Number 3590) granting the FWC lead management authority for 44,457 acres of the AWMA (Appendix 11.2). The remaining 6,067 acres are titled to the SRWMD and cooperatively managed by the FWC and the SRWMD (Cooperative Management Agreement Number 11271) (Appendix 11.3).

Lease Agreement No. 3590 states that the FWC has lead management authority and is responsible for the operation of the AWMA as a Wildlife Management Area (WMA) in addition to several other responsibilities. Under this agreement, the FFS is a cooperative manager, providing advice and on-site assistance to the FWC in implementing prescribed burning, as well as timber planting and harvesting activities. Management guidance and directives are captured within Chapters 253, 259, 327, 370, 373, 375, 378, 379, 403, 487, 597, and 870 of the F.S. Further management authority derives from Article IV, Section 9 of the Florida Constitution. 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 3590 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."

The cooperatively managed SRWMD portion shown in Figure 5 is a part of the AWMA boundary. However, this Management Plan only pertains to the portions of the AWMA in which the FWC has lead management authority. Under Cooperative Management Agreement No. 11271, the FWC may conduct hunting programs and manage wildlife resources on lands owned by the SRWMD.

1.3 Acquisition

1.3.1 Acquisition History

The Board of Trustees first acquired 14,162 acres from The Nature Conservancy (TNC) in 1988 through the state's Conservation and Recreation Lands program. Twelve years later, they added another 8,667 acres from the St. Joe Paper Company (SJPC) under the Preservation 2000 (P2000) program.

In 2003, the Board of Trustees used the P2000 and Florida Forever acquisition programs to buy 18,610 acres from the SJPC. That same year, they purchased an additional 10.5 acres from a private landowner through the Florida Forever program, followed by another 80 acres from a different private landowner in 2006. In 2010, the Board of Trustees purchased roughly 2,849 acres from TNC through the FWC's Florida Forever Additions and Inholdings program. Most recently,

in 2019, they acquired approximately 78 acres from Econfina Timberlands, LLC, via the same state program.

1.3.2 Purpose for Acquisition of the Property

The purpose for acquiring the AWMA was to protect the watershed and water quality of the Wacissa and Aucilla rivers, along with dozens of pristine freshwater creeks and springs that wind through the area on their meandering flow to the coast, and the unique geological features of the area. The AWMA is managed by the FWC for the purpose of operating a WMA, providing ecological diversity, providing managed habitat for both common and imperiled wildlife, and providing the public with fish and wildlife-focused outdoor recreational opportunities.

1.3.3 Encumbrances

Currently, there are three easements on the area. Two are access easements, and another is a utility easement with Progress Energy, Inc.

Additionally, there is one conveyance deed between SJPC and Florida Power Corporation as well as four Apiary Agreements. There is also a Memorandum of Agreement (MOA) with the Florida Trail Association (FTA). Currently, these encumbrances do not pose any significant impediments to the overall management of the area.

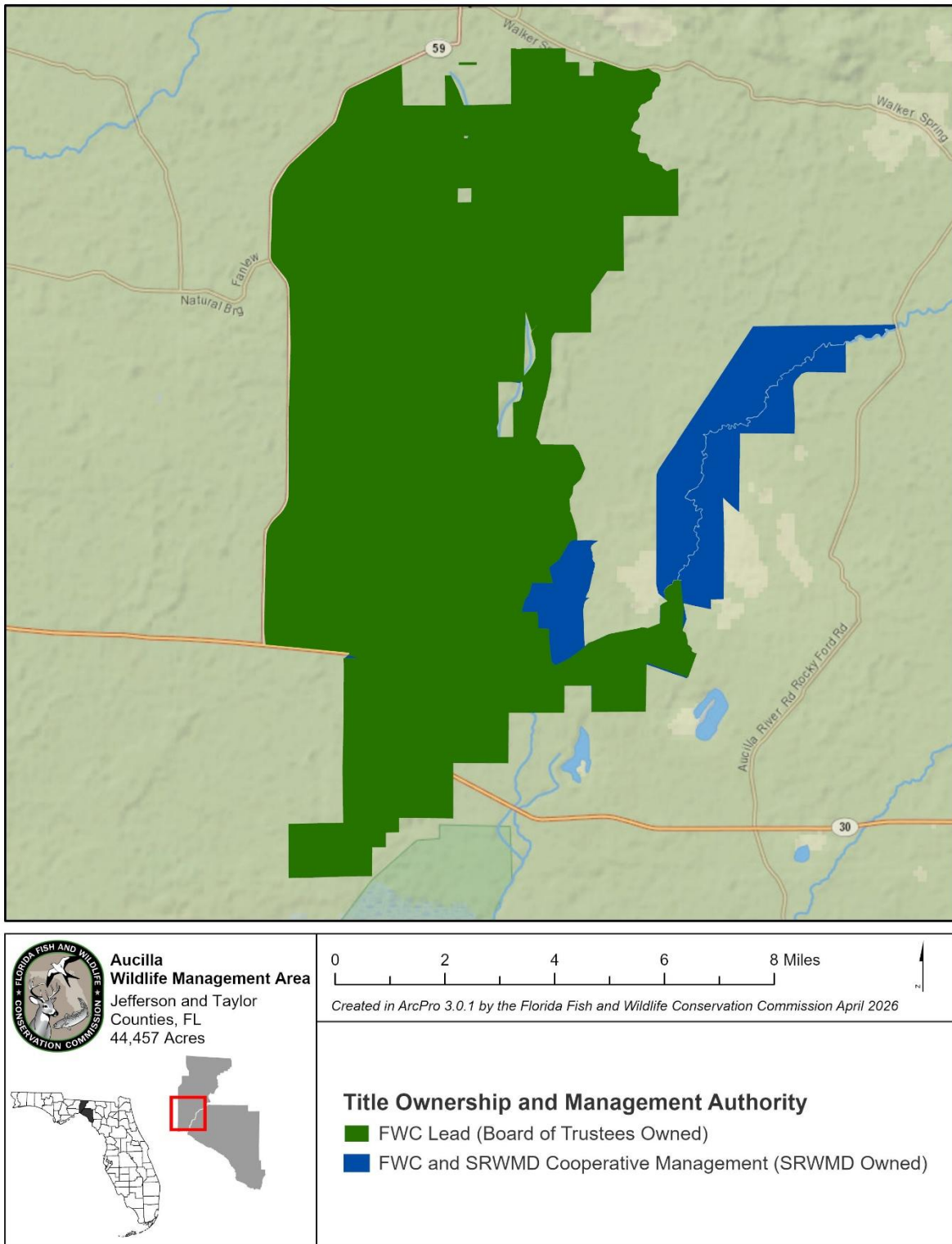


Figure 5. Title Ownership and Management Authority

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 to engage 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 4.2). 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 Monticello, Florida, on August 20, 2025, to obtain input from both public and private stakeholders regarding management of the AWMA. 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 11.4.1). Further, a public hearing, as required by Chapter 259.032(10), F.S., was held in Monticello, Florida, on December 2, 2025, to solicit input and comments from the public regarding the update to this Management Plan. A Management Prospectus was made available to the public 30 days prior to the hearing (Appendix 11.5). A report of that hearing can be found in Appendix 11.4.2. The public may provide input on Management Plans in development by visiting the FWC [website](#). Further testimony and input are received at a public meeting held by ARC. Input received from all public involvement efforts will be 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 entire AWMA is located in the Ocala Karst District, with most of the area being in the Woodville Karst Plain Province. The southeast portion of the AWMA is a part of the Perry Karst Plain Province. Geology of the AWMA includes Suwannee limestone, undifferentiated quaternary sediments, and the St. Marks Formation.¹

Suwannee limestone is yellowish to cream colored and consists of a variety of fossils, as well as chert and dolomite; this limestone comprises the upper part of the Floridan aquifer system. Undifferentiated quaternary sediments are made of siliciclastics that range from light gray, tan,

brown, or black; they include sand, clay, silt, and occasionally organics and/or gravel. The St. Marks Formation is composed of limestone and dolostone and is described as pale orange, light gray, and white; this formation is very fossiliferous, with numerous mollusk species.¹ On the AWMA, the maximum elevation is 42 feet above mean sea level.

2.1.2 Soils

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) data were used to identify the AWMA soil series. The map units described in the soil survey of the AWMA are distributed as shown 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.”² Soil map units may contain multiple soil components, which are given names that are unique identifiers. Appendix 11.6 lists the names and official map unit descriptions as determined by the NRCS.

Specific soils found on the AWMA are mostly Nutall-tooles fine sands, frequently flooded; Tooles-tooles, depressional-chaire, depressional, fine sands; and, Chaire-chaire, wet, fine sands soils, which make up about 70% of the area. Another 15% is made of Nutall-tooles complex. The rest of the AWMA is made of trace amounts of Surrency fine sand; Rutledge fine sand; seaboard-Bushnell-matmon complex; Leon-chaire fine sands; Leon fine sands; Chiefland-Chiefland, frequently flooded fine sands; Chipley fine sand; Matmon-wekiva-rock outcrop complex, occasionally flooded; Pamlico dorovan mucks; Tooles-nutall complex, frequently flooded; pits; eunola, goldhead, and tooles fine sands, commonly flooded; Ortega fine sand; Albany sand; hurricane fine sand; pelham fine sand; plummer fine sand; and, Melvina-moriah-lutterloh complex. About 0.6% of the AWMA is made of water.²

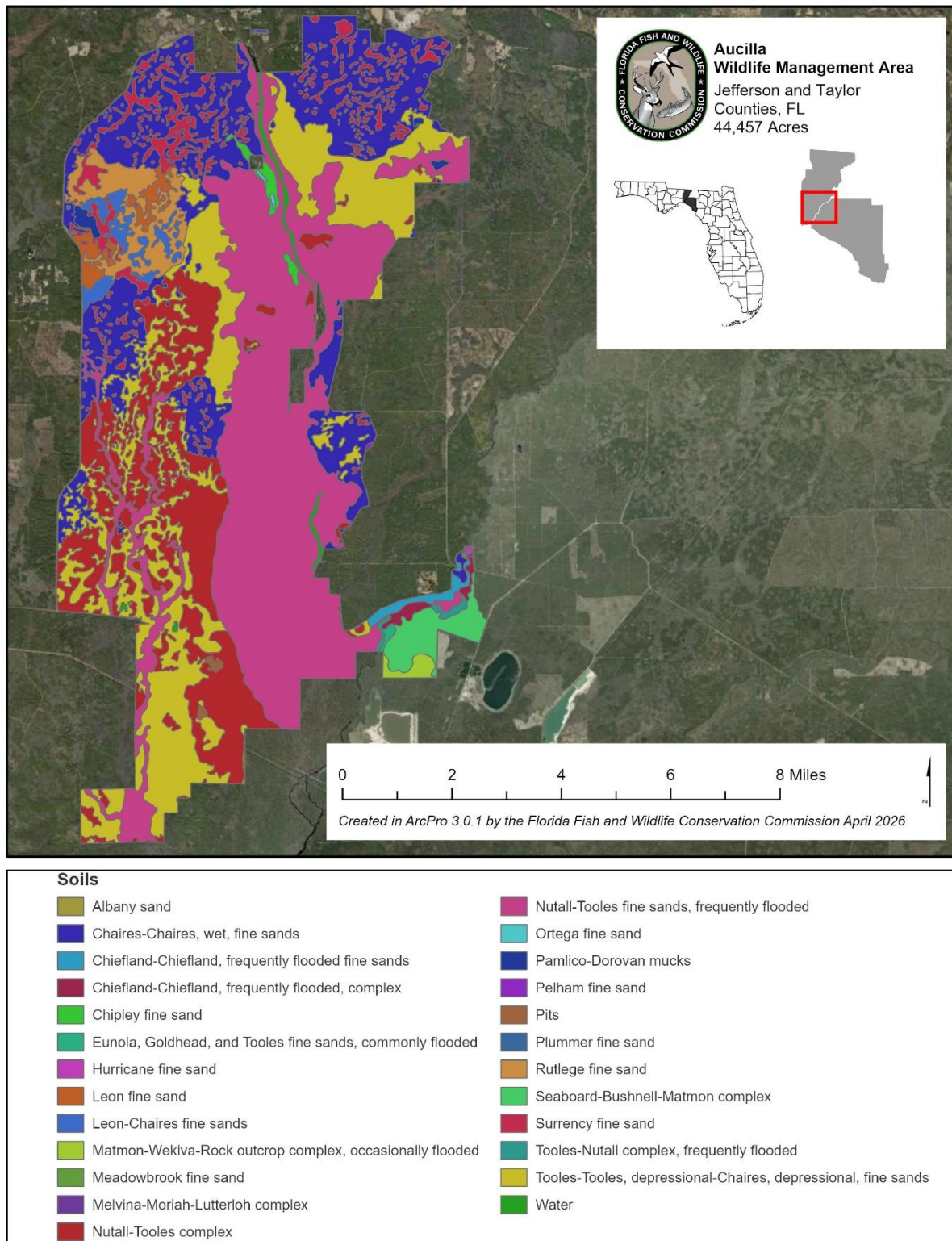


Figure 6. Soil Types

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 landcover types of the AWMA and documented 28 natural communities and altered landcover types on the AWMA (Table 3, Figures 7 and 8). Descriptions of the current natural communities and altered landcover types can be found in Appendix 11.7.

Additionally, native plant species found on the AWMA have been documented and recorded by either FWC staff or contractors (Appendix 11.8.1). Currently, 22 imperiled plant species and 28 non-native plant species have been documented (Tables 4 and 5, Section 2.2).

Table 3. Current Natural Communities and Altered Landcover Types

Community Type	GIS Acres	Percentage
Artificial Pond	64.14	0.14%
Basin Swamp	7,462.35	16.45%
Baygall	3,059.38	6.74%
Depression Marsh	39.28	0.09%
Developed	11.82	0.03%
Dome Swamp	898.11	1.98%
Firebreak	18.70	0.04%
Floodplain Swamp	646.34	1.42%
Hydric Hammock	15,919.32	35.08%
Linear Feature	0.67	<0.01%
Mesic Flatwoods	421.55	0.93%
Mesic Hammock	1,640.78	3.62%
Pasture - Improved	3.98	0.01%
Pine Plantation	1,223.77	2.70%
Restoration Mesic Flatwoods	6,974.41	15.37%
Restoration Mesic Hammock	204.22	0.45%
Restoration Sandhill	50.00	0.11%
Restoration Scrubby Flatwoods	19.03	0.04%
Restoration Upland Hardwood Forest	5.80	0.01%
Restoration Wet Flatwoods	4,793.61	10.56%
Restoration Wet Prairie	45.68	0.10%
Road	593.36	1.31%
Scrubby Flatwoods	2.34	0.01%
Sinkhole	0.63	<0.01%
Spring-run Stream	256.35	0.56%
Upland Hardwood Forest	608.15	1.34%
Utility Corridor	29.11	0.06%
Wet Flatwoods	382.53	0.84%

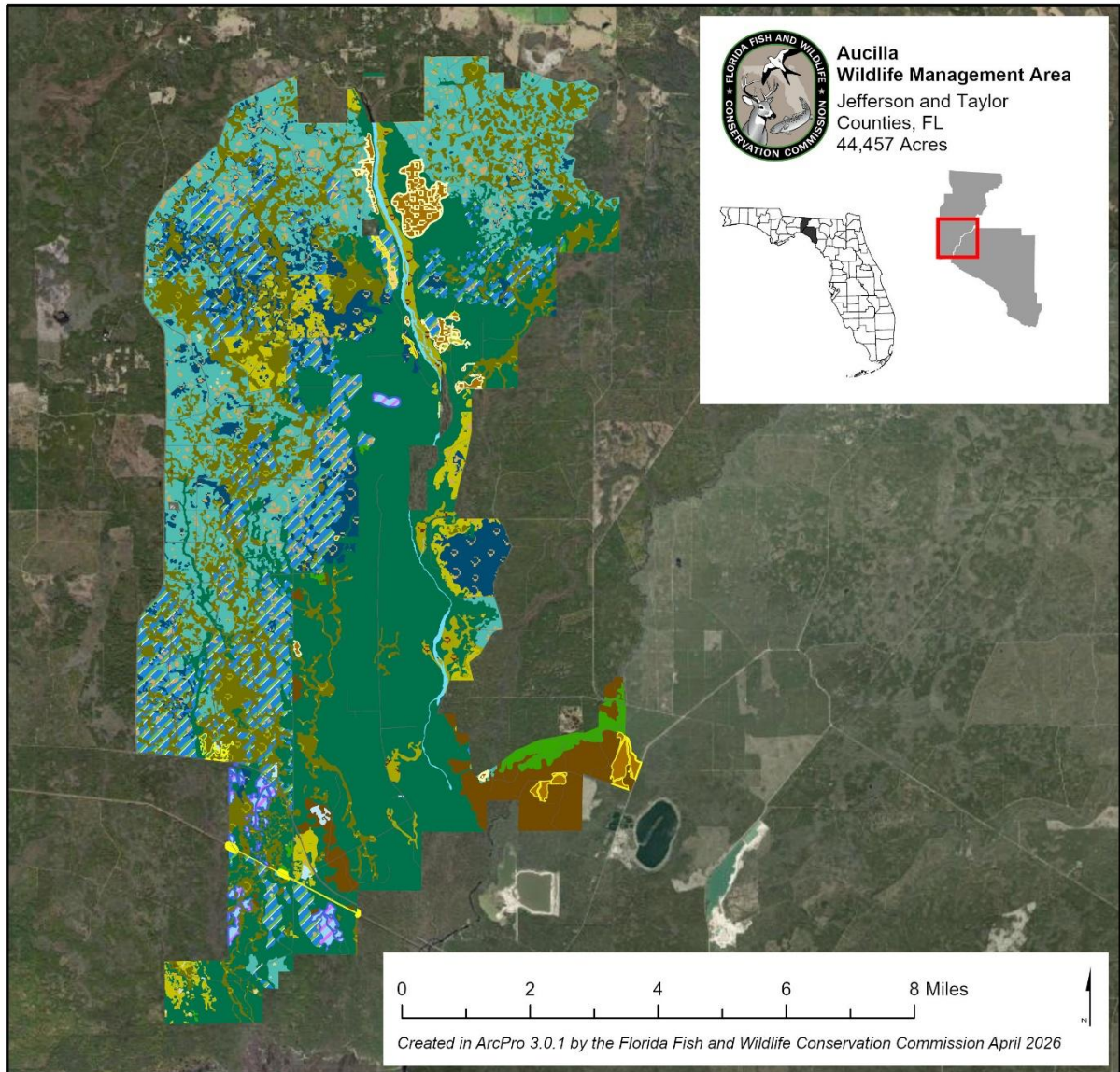


Figure 7. FNAI Current Natural Communities and Altered Landcover Types

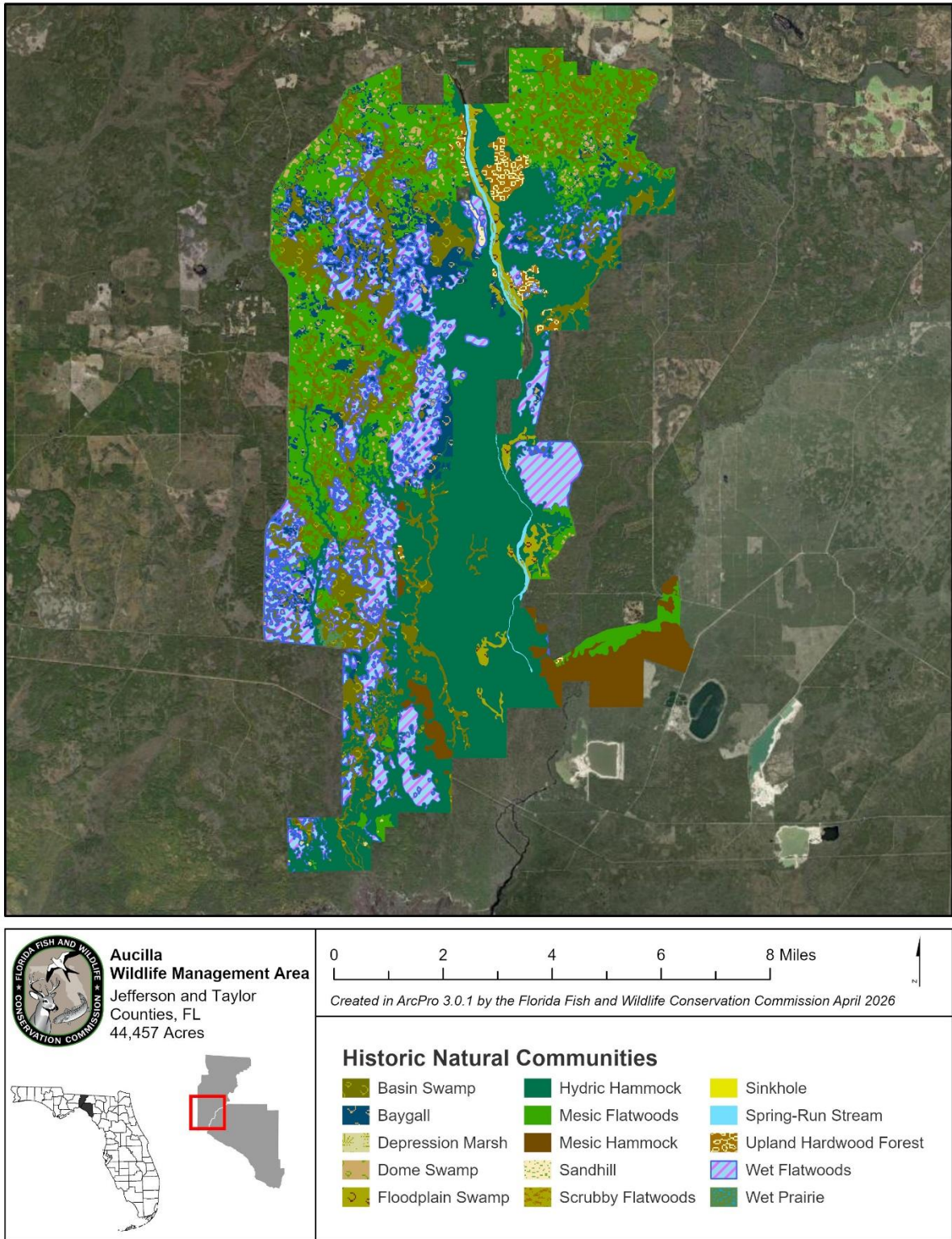


Figure 8. Historic Natural Communities

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 2025 on the AWMA and identified 16 imperiled plant species, of which two are state-designated Endangered and 14 are state-designated Threatened. Additional imperiled plant species were documented by FWC, and all are listed in Table 4. The protections afforded plants that occur on conservation lands, in conjunction with management actions including invasive plant removal and prescribed fire, should continue to maintain and enhance habitat for these and other imperiled plants. As such, these species should persist under planned management on the AWMA.

In addition to the imperiled plants, six plants that are state-designated as Commercially Exploited are known to occur (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*
<i>Andropogon arctatus</i>	Pine-woods bluestem	ST	G3, S3
<i>Athyrium filix-femina</i>	Southern lady fern	ST	G5T5, S4
<i>Carex chapmannii</i>	Chapman's sedge	ST	G3, S3
<i>Centrosema arenicola</i>	Sand butterfly pea	SE	G2Q, S2
<i>Cleistes divaricata</i>	Spreading pogonia	SE	G4, S1
<i>Epidendrum conopseum</i>	Green-fly orchid	CE	G4, S4S5
<i>Hexastylis arifolia</i>	Heartleaf wild ginger	ST	G5, S3
<i>Leitneria floridana</i>	Corkwood	ST	G3, S3
<i>Lilium catesbaei</i>	Catesby lily	ST	G4, S4
<i>Listera australis</i>	Southern twayblade	ST	G4, S3S4
<i>Lobelia cardinalis</i>	Cardinal flower	ST	G5, S4
<i>Malus angustifolia</i>	Crabapple	ST	G5, SNR
<i>Matelea gonocarpus</i>	Angle pod	ST	G5, SNR
<i>Osmunda cinnamomea</i>	Cinnamon fern	CE	G5, S4
<i>Osmunda regalis</i>	Royal fern	CE	G5, S5
<i>Pinguicula caerulea</i>	Blue-flowered butterwort	ST	G4, S3S4
<i>Platanthera chapmanii</i>	Chapman's fringed orchid	SE	G2G3, S2
<i>Platanthera flava</i>	Palegreen orchid	ST	G5T4?Q4, S3S4
<i>Rhapidophyllum hystrix</i>	Needle palm	CE	G4, S4
<i>Rhododendron canescens</i>	Pink azalea	CE	G5, S4

Scientific Name	Common Name	Status	FNAI Ranks*
<i>Salix floridana</i>	Florida willow	SE	G2G3, S2S3
<i>Sarracenia minor</i>	Hooded pitcherplant	ST	G4, S4
<i>Sarracenia psittacina</i>	Parrot pitcherplant	ST	G4, S4
<i>Sarracenia purpurea</i>	Decumbent pitcherplant	ST	G3, S3
<i>Serenoa repens</i>	Saw palmetto	CE	G4G5, S4S5
<i>Tipularia discolor</i>	Crane-fly orchid	ST	G5, S4
<i>Zephyranthes atamasca</i>	Rainlily	ST	G4G5T4, S4
<i>Zephyranthes treatiae</i>	Treat's zephyr-lily	ST	G4G5T4, S4

*FNAI Ranking System descriptions can be found in Appendix 11.11

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

It is possible other imperiled species occur on the AWMA; if encountered, staff will document them. 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 AWMA can be found in Appendix 11.9.

2.2.2 Non-native Plants

FWC biologists and contractors have documented 28 non-native plant species on the AWMA, of which 14 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
<i>Albizia julibrissin</i>	Silktree, Mimosa	I
<i>Cardamine hirsuta</i>	Hairy bittercress	-
<i>Citrus trifoliata</i>	Hardy orange	-
<i>Citrus x aurantium</i>	Sour orange	-
<i>Clerodendrum indicum</i>	Skyrocket	-
<i>Commelina diffusa</i> var. <i>diffusa</i>	Common dayflower	-
<i>Crotalaria lanceolata</i>	Lanceleaf rattlebox	-
<i>Crotalaria spectabilis</i>	Showy rattlebox	-
<i>Cyperus esculentus</i>	Yellow nutgrass	-

Scientific Name	Common Name	FISC Category
<i>Cyperus rotundus</i>	Nutgrass	-
<i>Dioscorea bulbifera</i>	Air-potato	I
<i>Eichhornia crassipes</i>	Common water hyacinth	I
<i>Hydrilla verticillata</i>	Waterthyme, Hydrilla	I
<i>Imperata cylindrica</i>	Cogongrass	I
<i>Ipomoea hederacea</i>	Ivyleaf morning glory	-
<i>Ligustrum sinense</i>	Chinese privet	I
<i>Lygodium japonicum</i>	Japanese climbing fern	I
<i>Melia azedarach</i>	Chinaberry	II
<i>Oplismenus hirtellus</i>	Woodsgrass	-
<i>Panicum repens</i>	Torpedo grass	I
<i>Persicaria longiseta</i>	Oriental lady's-thumb	-
<i>Salvinia minima</i>	Water spangles	I
<i>Sesbania punicea</i>	Rattlebox	II
<i>Solanum viarum</i>	Tropical soda apple	I
<i>Sporobolus indicus</i>	Smutgrass	-
<i>Triadica sebifera</i>	Chinese tallow, Popcorn tree	I
<i>Wisteria sinensis</i>	Chinese wisteria	II
<i>Zeuxine strateumatica</i>	Lawn orchid	-

2.3 Fish and Wildlife Resources

As described above, the AWMA 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 AWMA an excellent place to observe wildlife. The AWMA's hydric hammock, basin swamp, baygall, mesic hammock, and other natural communities provide critical habitat for resident and migratory wildlife. The FWC maintains an inventory of fauna occurring on the AWMA listed in Appendix 11.8.2, 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 federally-designated as Threatened or Endangered by the USFWS or state Threatened by the FWC. This designation is also commonly known as "listed species." Table 6 outlines all imperiled fish and wildlife that have been observed on the AWMA.

Table 6. Imperiled Fish and Wildlife Species

Scientific Name	Common Name	Status	FNAI Ranks*
<i>Egretta caerulea</i>	Little blue heron	ST	G5, S4
<i>Gopherus polyphemus</i>	Gopher tortoise	ST	G3, S3
<i>Graptemys barbouri</i>	Barbour's map turtle	FT	G2, S2

*FNAI Ranking System descriptions can be found in Appendix 11.11

Acronym	Status
FT	Federally Threatened
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 AWMA for eligibility as a recipient site for gopher tortoises. Based on preliminary Geographic Information System (GIS) analysis conducted by the FWC, the AWMA does not meet the [Gopher Tortoise Permitting Guidelines](#) (April 2024), and therefore, would not be permissible as a gopher tortoise recipient site. This determination is due to the gopher tortoise habitat within the AWMA being limited to small patches of mesic flatwoods that are better drained than the surrounding wet-mesic flatwoods. These areas support only a few individuals, with observations confined to very small, isolated patches. The predominant soil types across the site are wet and poorly drained, making them unsuitable for sustaining robust gopher tortoise populations.

2.3.2 Non-native Wildlife Species

In addition to the native wildlife species listed in Appendix 11.8.2, wild hogs (*Sus scrofa*) are the only non-native wildlife species that have been documented on the AWMA. 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 Sections 4.5 and 5.4.

2.3.3 FNAI Element Occurrences

A diversity of wildlife species is found on the AWMA. The FWC uses the FNAI Natural Heritage Database to assist in identifying and recording sensitive resources on FWC-managed areas. This database also supplemented the development of the species tables found in Appendix 11.8. 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 methodology that incorporates many factors, including geographic range; number, size, and condition of known occurrences; population size and trends; life history characteristics; and threats. An explanation of Natural Heritage rank and definitions are in Appendix 11.11 and may be found [online](#).

The FNAI element occurrence records include 29 occurrences of wildlife species in the vicinity of the AWMA. 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 Tables 4 and 6. Appendix 11.10 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 that have been reported or documented on the AWMA are tracked by FNAI:

Scientific Name	Common Name	FNAI Ranks*
<i>Aramus guarauna</i>	Limpkin	G5, S3
<i>Anthanassa texana seminole</i>	Seminole crescent	G5T3T4, S2S3
<i>Collophrys gryneus sweadneri</i>	Florida olive hairstreak	G5T2T3, S2S3
<i>Cambarellus schmitti</i>	Fontal dwarf crayfish	G2G3, S2S3
<i>Crangonyx grandimanus</i>	Florida cave amphipod	G2G3, S2S3
<i>Crangonyx parhobbsi</i>	Florida Big Bend cave amphipod	G1G2, S1S2
<i>Crotalus adamanetus</i>	Eastern diamondback rattlesnake	G3, S3
<i>Elanoides forficatus</i>	Swallow-tailed kite	G5, S2
<i>Eudocimus albus</i>	White ibis	G5, S4
<i>Haliaeetus leucocephalus</i>	Bald eagle	G5, S3
<i>Hesperia meskei straton</i>	Eastern Meske's skipper	G3G4T3, S2S3
<i>Lethe appalachia</i>	Appalachian brown	G5, S2S3
<i>Macrochelys temminckii</i>	Alligator snapping turtle	G3, S3
<i>Nyctanassa violacea</i>	Yellow-crowned night-heron	G5, S3
<i>Peucaea aestivalis</i>	Bachman's sparrow	G3, S3
<i>Procambarus horsti</i>	Big blue spring cave crayfish	G1, S1
<i>Pseudemys concinna suwanniensis</i>	Suwannee cooter	G5T3, S3
<i>Pseudemys nelsoni</i>	Florida red-bellied turtle	G5T2Q, S2
<i>Ursus americanus floridanus</i>	Florida black bear	G5T4, S4

*FNAI Ranking System descriptions can be found in Appendix 11.11

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 AWMA are designated as Class III and classified for fish consumption and recreation or limited recreation; as well as propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Additionally, it is the policy of the DEP to afford the highest protection to Outstanding Florida Waters (OFW) and Outstanding National Resource Waters (Chapter 62-302.700 F.A.C.). Portions of the AWMA, including the Wacissa and Aucilla rivers are designated as OFW. No degradation of water quality, other than that allowed in subsections Chapter 62-4.242(2) and (3), F.A.C., is

permitted in these OFW, notwithstanding any other DEP rules that may allow water quality lowering. The AWMA is located north of the Big Bend Seagrass Aquatic Preserve and both the Aucilla and Wacissa rivers flow into this preserve.

Additional water resources include many clear-water springheads found along the Aucilla and Wacissa rivers (Figure 9). The springs located within the AWMA are Minnow Spring, Jefferson Blue Spring, Little Blue Spring, Garner Spring, Big Blue Spring, Buzzard Log Spring, and Cassidy Springs. There are no lakes or ponds that are named in AWMA. The underlying aquifers are the Floridan Aquifer and an intermediate confining unit. The Floridan Aquifer covers the southern half of AWMA. The intermediate confining unit covers the northern half. There is a group of springs occurring in the upper two miles of the Wacissa River that collectively form the Wacissa Springs Group which flows at first magnitude rate.

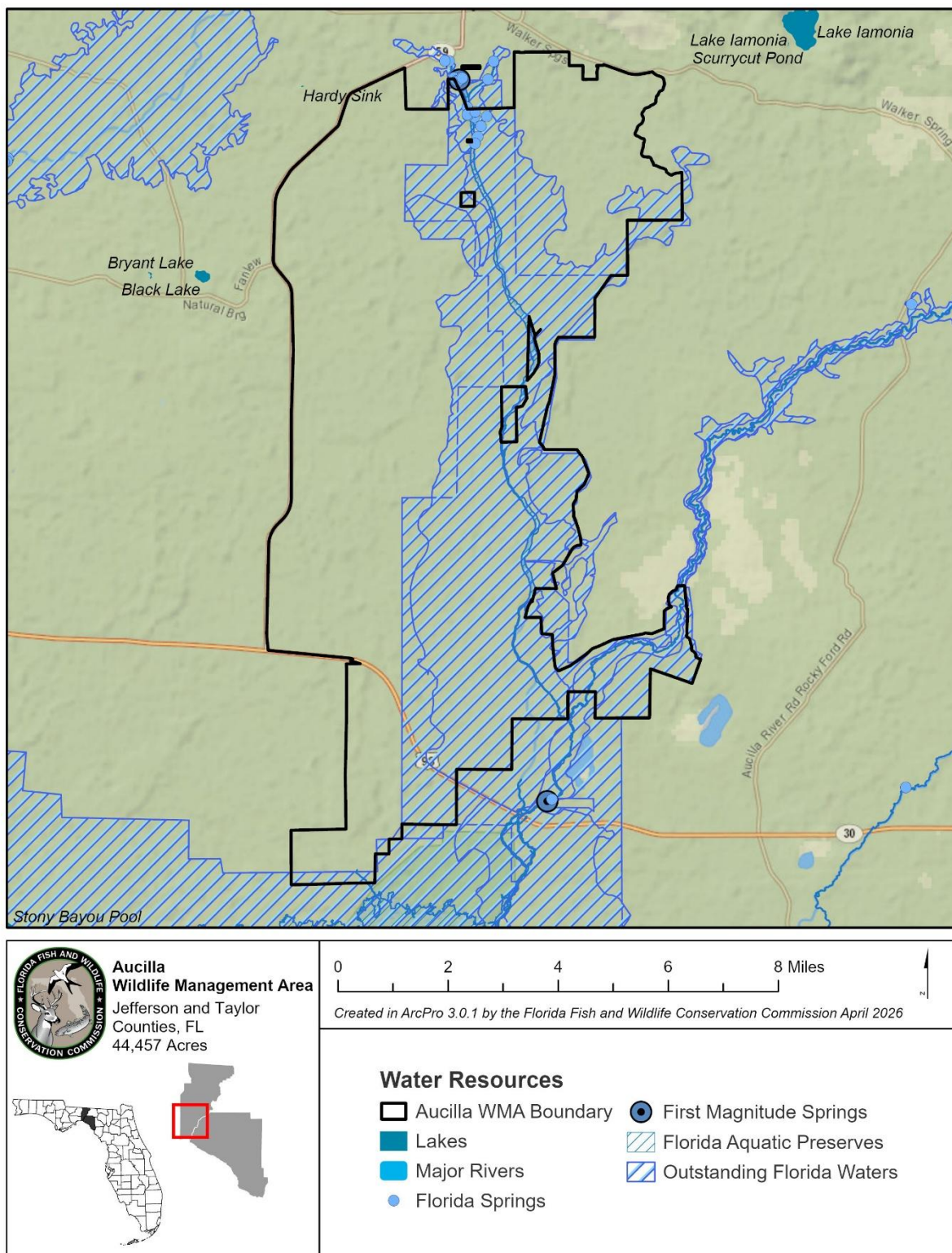


Figure 9. Water Resources

2.5 Forest Resources

Timber resources include approximately 1,224 acres of pine plantation. In 2015, FWC contracted with Larson & McGowin, Inc. to develop a comprehensive and prescriptive silvicultural plan that is still being used today. In 2025, a timber inventory was done on the AWMA by F4-Tech.

2.6 Beaches and Dunes

The AWMA does not contain beaches or dunes.

2.7 Mineral Resources

Although there is an historic mining operation east of the AWMA, deposits of commercially valuable minerals (oil, gas, phosphate, or limerock) are not known to occur on the area in quantities considered economically feasible to develop.

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 13 previous cultural resource surveys have been conducted on the AWMA. A review of the FMSF indicates that 331 cultural resources have been recorded on the AWMA, none of which have been determined eligible for inclusion in the National Register of Historic Places (Appendix 11.12). 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.

2.9 Scenic Resources

The Wacissa and Aucilla river corridors provide exceptional scenic viewing for boaters traversing the AWMA. The area showcases excellent examples of upland and wetland natural communities, alongside unique karst features and river sinks. The landscape transitions beautifully throughout the year, featuring wildflowers blooming in the spring and cool, spring-fed paddles in the summer. During the fall, migratory warblers and colorful foliage can be observed along the Aucilla Sinks Trail, while the Florida National Scenic Trail remains open to hikers throughout the year.

3 Uses of the Property

3.1 Previous Use and Development

For thousands of years before European contact, Native Americans lived, hunted, fished, and gathered along the Wacissa and Aucilla rivers and the Gulf Coast. Archaeological sites within AWMA, some dating back 12,000 years, document long-term Indigenous occupation on the same

high, dry ground later used by 20th century hunters and fishermen. The area's coastal forests and streams provided abundant resources for both early inhabitants and modern Floridians.

Significant landscape change began with Spanish settlement in the sixteenth century, which introduced livestock and more intensive agricultural practices. By the late 1800s and early 1900s, the region had largely shifted to industrial forestry, and commercial timber production became the dominant land use across the Aucilla and Wacissa River Basins. Native longleaf-wiregrass communities were cleared, bedded, and replanted with slash and loblolly pine, while fire exclusion and extensive road and ditch construction altered natural hydrology and ecosystem structure.

Before the state acquired the AWMA, SJPC and Buckeye Cellulose Company managed the land for industrial silviculture. Their focus on commercial pine production transformed historically open longleaf pine systems into densely stocked plantations with thick hardwood understories. Despite these ecological changes, the previous landowners maintained traditional outdoor recreation, including hunting, fishing, sightseeing, camping, and picnicking. SJC and Buckeye also supported public access to the Wacissa and Aucilla rivers by establishing boat ramps and landings.

3.2 Current Use

Currently, in both Jefferson and Taylor counties, the AWMA is zoned as Conservation. According to Jefferson County's Comprehensive Plan, this designation stipulates extreme limitations for potential development. Both Jefferson and Taylor county's future land use maps indicate that the AWMA will continue to be designated and zoned as Conservation. The AWMA is managed for the conservation and protection of fish and wildlife habitat and fish and wildlife-focused public outdoor recreation. Annual management actions include prescribed burning; wildlife habitat restoration and improvement; invasive species maintenance and control; road 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 AWMA is being managed as a multiple-use conservation land, incorporating uses related to wildlife, fisheries, forest management, and fish and wildlife-focused public outdoor recreation. Resource uses are diverse and consistent with the purposes for which the area was acquired. The AWMA offers a variety of outdoor activities, including hunting, hiking, paddling, photography, bicycling, nature study, and horseback riding. The area's diverse plant life supports a wide range of wildlife, making it an excellent destination for nature watching. Located close to population centers in Jefferson and Taylor counties, public use of the area is expected to grow as awareness of these opportunities increases.

3.2.1 Hunting

Currently, the AWMA offers several hunting seasons including archery, muzzleloading gun, family still hunt, general gun, spring turkey, wild hog-dog, and small game. For more information on hunting opportunities at the AWMA visit the following link: [Aucilla WMA Hunting Brochure](#).

3.2.2 Fishing

Fishing and frogging are authorized year-round at the AWMA. Bank fishing, as well as fishing in sink holes and river rises along the trail system, is popular at the AWMA. The Wacissa River offers angling opportunities for a variety of species including bass and bluegill.

3.2.3 Paddling and Boating

The AWMA surrounds portions of the Wacissa and Aucilla rivers, both state-designated paddling trails. The Wacissa, fed by 12 major springs, is a recreational hub for swimmers, snorkelers, boaters, and anglers and is perfect for beginning paddlers and families. The Aucilla River, with its many shallows and rock-filled shoals, offers more challenging paddling.

3.2.4 Trails and Roads

The Aucilla Sinks Trail portion of the nationally designated Florida National Scenic Trail (FNST) traverses approximately six miles of the AWMA. There are approximately 120 miles of road within the AWMA, and hiking, bicycling, and horseback riding are allowed on all of them. Class 1 electric bicycles may be operated according to rules for traditional, non-motorized bicycles. All other electric bicycles may be operated only on named or numbered roads open to motorized vehicles. For more information visit MyFWC.com/ebike.

3.2.5 Camping

Primitive camping (tents only) is available for hikers at designated sites along the FNST.

3.2.6 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](#).

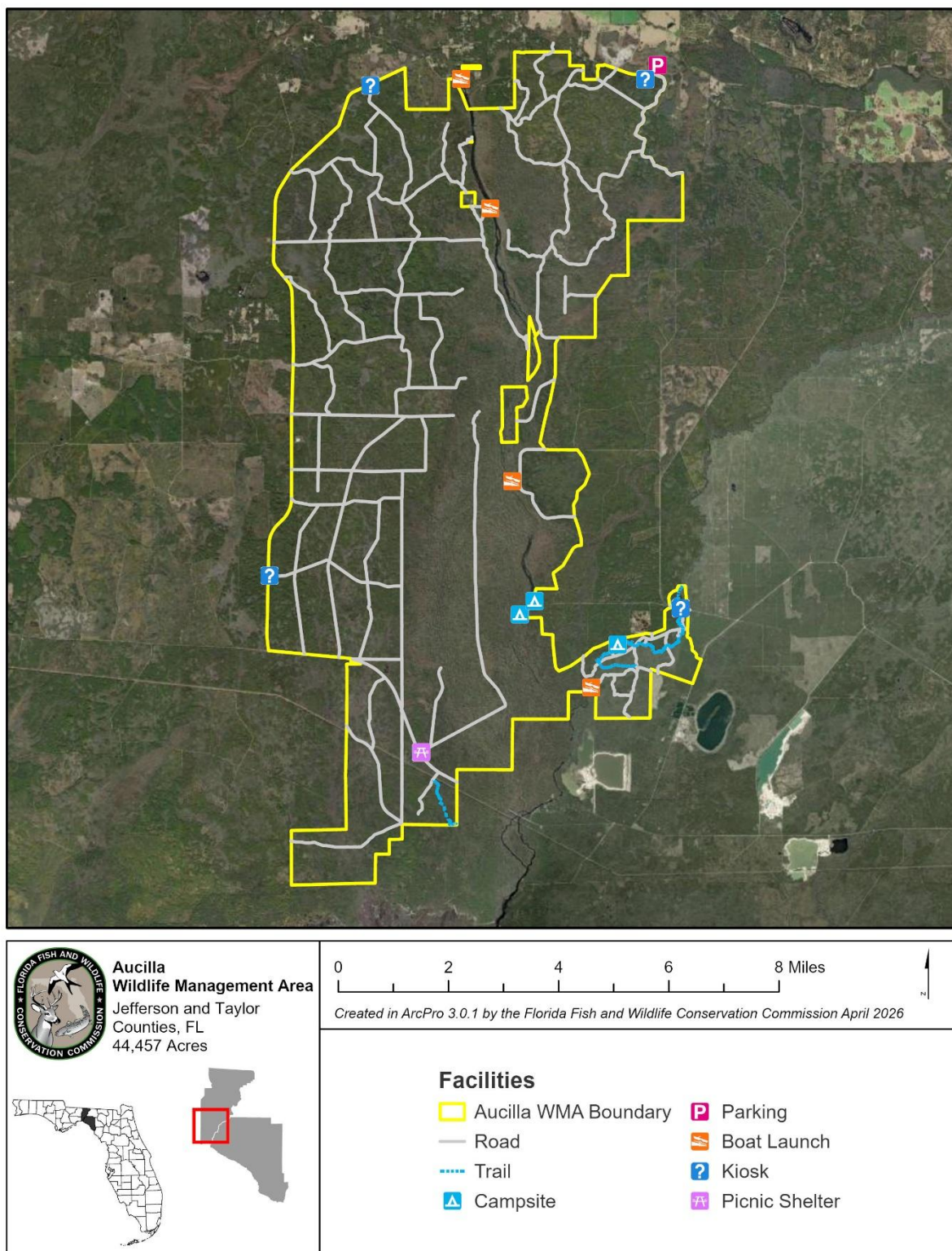


Figure 10. Facilities

3.3 Adjacent Land Uses

A majority of the AWMA is in Jefferson County, with a small portion in Taylor County. Over the last 50 years, the economy has been based primarily on agriculture. Almost one half of the Jefferson County non-farm workforce commutes outside of the county for employment. Lands immediately adjacent to the AWMA are classified as conservation, agriculture, and residential. There is a small piece of property east of the AWMA which is zoned for mining.

3.4 Visitation, Economic Benefits, and Revenue-generating Potential

Visitation and public use of the area for fish and wildlife-focused public outdoor recreational opportunities is the primary source of economic benefits from the AWMA, which contributes to the overall economy for the northwest region of Florida. The 2022 U.S. Census estimates that there are 14,923 people living in Jefferson County and 21,375 people living in Taylor County. The Department of Economic Affairs, Bureau of Economic and Business Research's (BEBR) medium-range population projection indicates that in the year 2035, there will be 15,500 people living in Jefferson County and 21,500 people living in Taylor County. In Fiscal Year 2024/2025, an estimated 73,965 people visited the AWMA. Primarily as a result of this visitation and use of the area, the FWC economic analysis estimates that the AWMA generated an annual economic impact of \$14,452,021* for the State and the northwest region of Florida. This estimated annual economic impact has aided in the support or creation of an estimated 147 jobs.*

Further revenue-generating potential of the AWMA will depend upon future uses described in the 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

The AWMA will be managed under the multiple-use concept as a WMA. The AWMA will provide fish and wildlife-focused public outdoor recreation and educational opportunities, while protecting the natural and cultural resources found on the area. Any natural and cultural resources on the AWMA 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 AWMA. 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. Uses classified as "Conditional" indicate that the use may be accepted 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, 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 AWMA 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 the AWMA 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 AWMA.

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 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 FWC's evaluation confirms that the AWMA continues to meet its original conservation goals while providing high-quality outdoor recreation for the public. However, staff recommends the surplus of a 10-acre parcel on the northern boundary because it is separated from the main area and located within a rural residential zone.

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 AWMA 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 AWMA. 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. An LMR was conducted for the AWMA in 2023, and the recommendations from that review were considered during the development of this Management Plan (Appendix 11.13). These reviews determine whether the lands are being managed for the purposes for which they were acquired and in accordance with their management plan adopted pursuant to Section 259.032, F.S. 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 pursuant to Section 259.032, F.S. The 2023 LMR team scores were overall excellent and did not identify any items requiring improvement in the field or in the Management Plan.

4.2 Adaptive Management

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 AWMA.

4.2.1 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 0-10; a rank of 10 being of greatest value. The FLAM (2024) indicates that the AWMA has a medium mean wildlife value of 6.5 (Figure 11).

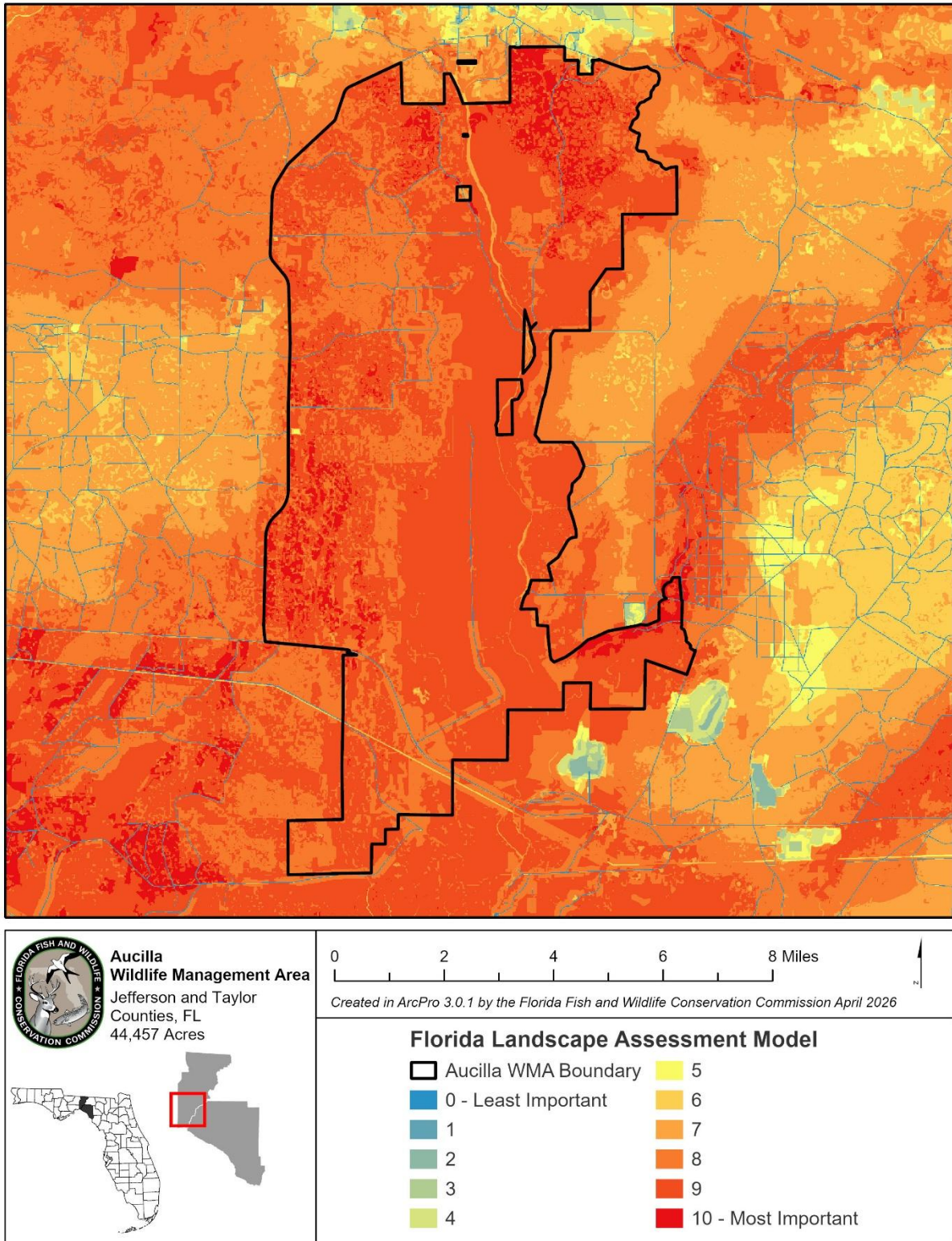


Figure 11. Florida Landscape Assessment Model

4.2.2 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.

4.2.3 Implementation

The AWMA Management Plan serves as the guiding framework to implement this adaptive management process. It serves as the underpinning for the integration of management programs underway to accomplish needed conservation actions that are planned to manage the natural resources of the AWMA 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 AWMA, the FWC will focus on land management activities and projects that support or restore native habitat diversity, emphasizing maintenance of natural communities and restoration of disturbed areas. The AWMA has functioning natural communities, including hydric hammock, basin swamp, baygall, mesic hammock, and others 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, the planting of species appropriate to the natural community being restored, and/or the use of mechanical or chemical management techniques as appropriate.

4.3.1 Objective-Based Vegetation Management

The FWC uses a comprehensive resource management approach to improving FWC-managed areas. Objective-Based Vegetation Management (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 AWMA had OBVM monitoring conducted for the first time in the fall of 2025.

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 AWMA. The most recent natural community map update was completed in 2021; however, the area will be having a

recertification done in spring of 2026. New acquisitions that occur will be mapped for natural communities and altered landcover 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 communities being monitored at the AWMA are mesic flatwoods and wet flatwoods. 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. 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 allow changes over time to be evaluated against the management actions taken by staff. This information is then used to guide and prioritize future management efforts.

4.3.2 Prescribed Fire 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 AWMA in accordance with natural community management objectives. Applying prescribed fires within the natural range of variation in frequency, intensity, and seasonality for each natural community provides appropriate habitat for fire-dependent species, while still allowing the persistence of less fire-tolerant species.

Whenever possible, existing firebreaks such as roads and trails, as well as natural breaks such as creeks and wetlands, will be used to define management units. Disk harrows, mowing, and foam lines will be used when safe and appropriate to minimize disturbance to native groundcover.

Except for wildfire suppression, mechanical soil disturbance in wetland ecotones will be avoided to protect habitats for important rare species that often occur between upland and wetland margins. Creation of firebreaks will be avoided in wetland margins unless it is necessary to defend the boundary of a managed area. When safe, fires are allowed to burn into the edges of marshes, swamps, and other wetlands to maintain these habitats. With some exceptions, such as scrub and scrubby flatwoods, most fire-managed natural communities are best maintained, or improved, with fire returns of two to three years, preferably during the spring and early summer months when appropriate.

In addition to the general prescribed fire management guidelines described above, an area-specific Prescribed Burn Plan has been developed and implemented (Appendix 11.14). This plan includes, but is not limited to, delineation of burn 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.

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 landcover types over the course of the previous management period, beginning in 2016. 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 AWMA. Following is a list of the primary habitat restoration and improvement activities that have occurred since 2016.

- The Prescribed Burn Plan was updated in 2026.
- 43,319 acres of the area's fire adapted communities have been treated with prescribed fire.
- 774 acres have been mechanically treated including roller chopping and mowing.
- 23 acres have begun groundcover restoration.
- 2,476 acres have been chemically treated to reduce understory/mid-story vegetation, including titi (*Cliftonia monophylla* and *Cyrtilla racemiflora*), large gallberry (*Ilex coriacea*), and hardwood trees.

Continuing habitat management activities will focus on enhancing natural communities, reestablishing and 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 Section 5.4. Further specific habitat management and improvement objectives planned for the AWMA are described in Section 5.

4.4 Fish and Wildlife Management, Enhancement, and Population Restoration

Across the AWMA, the size and diversity of 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 AWMA. Natural communities vital to locally important species include hydric hammock, basin swamp, baygall, mesic hammock, and others. Restoration and improvement of any altered communities, to expand habitat on the AWMA, is also emphasized.

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 AWMA 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 4.4.1 and Appendix 11.15 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 Wildlife Conservation Prioritization and Recovery (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. The current WCPR Strategy for the AWMA was adopted in 2019 (Appendix 11.15). 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 Fish and Wildlife Management Activities and Accomplishments

During the previous planning period, the FWC conducted monitoring activities for five 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 game and nuisance animal species. Following is a list of activities and monitoring outcomes that have occurred since 2016 to further FWC's mission for managing fish and wildlife on the AWMA.

- Two gopher tortoise burrow surveys occurred, one in 2018 and another in 2024.
- Surveys for the frosted flatwoods salamander (*Ambystoma cingulatum*) were done by FNAI in 2019 and 2021; another was done by the Amphibian and Reptile Conservancy in 2025.
- In the 2026 annual bald eagle (*Haliaeetus leucocephalus*) aerial survey, area staff have identified at least five active nests.
- From 2016-2023, and again in 2025, there were annual aerial surveys for wading birds. During the surveys, FWC staff identified 12 nesting colony sites, four of which were occupied in 2025.

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 occur naturally in 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

AWMA, 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 Sections 4.5.1 and 4.5.2 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 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 4.5.2). FWC staff strive to either eradicate infestations or achieve maintenance rotation. Maintenance rotation is defined as having a given area/acreage with invasive species infestations reduced to a level where no ecological harm will occur by skipping any treatment for a period of one- to several-years, depending on the species. Maintenance rotation is not necessarily synonymous with eradication, which is usually impractical to achieve.

Maintenance rotation intervals for invasive plants vary greatly by species. Generally, woody species that form canopies will need a thorough initial treatment and a follow-up treatment the next growing season. Thereafter, the maintenance rotation treatment will need to follow seed germination and seedling/sapling regrowth patterns, with subsequent treatments being necessary every two-to-10-years, depending on initial infestation level, seed bank presence, and likely new dispersal into the area from neighboring populations of these species. Woody species that dominate the midstory will need a treatment regimen like those that form canopies, except the subsequent retreatment rotation would be every two- to five-years.

Herbaceous species that can affect the midstory and canopy, including vines, weak lianas, and climbing ferns, need to be detected and treated as early as possible. These need to have an aggressive initial treatment, followed by yearly treatments, until the populations no longer affect the midstory. At this point, a two- to three-year rotation, with treatment as necessary, will keep these infestations in maintenance rotation.

Herbaceous and weakly woody species that only dominate the groundcover can be particularly challenging. This group is diverse and includes species such as tropical soda apple (*Solanum viarum*) and cogongrass (*Imperata cylindrica*). 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 will 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.

The FWC will continue to focus control and maintenance activities on areas identified as having invasive plant occurrences, as well as treating any new occurrences as they are identified through

continued monitoring activities. Natural disasters such as tropical cyclones, flooding, wildfire, and drought can both negatively and positively impact maintenance rotation of an area, and affected acreage should be re-surveyed following any of these events to reassess the maintenance state of the area.

The degree of maintenance effort for invasive plant occurrences often varies substantially by species, level of disturbance, environmental conditions, and other land management activities such as timber harvesting, groundcover restoration, etc., and can also be affected by the status of ongoing eradication and control efforts. FWC staff will make special efforts to treat invasive species in coordination with mechanical treatments and prescribed fire, so optimal results are achieved. Treatment strategies for invasive plants will be adjusted over time as conditions change on the AWMA. 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 AWMA by requiring all personnel, both contracted and internal, to follow standard field cleaning and decontamination procedures. The AWMA 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. For areas on the AWMA that require treatments for aquatic based invasive species, FWC area staff will work closely with both FWC's Invasive Plant Management Section and FWC's Aquatic Habitat Conservation and Restoration Section for assistance and guidance on aquatic plant control.

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 AWMA, 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 AWMA 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. Wild hog populations are managed by hunts during the wild hog-dog, archery, general gun, and muzzleloading gun seasons. Wild hog populations may also be managed by trapping, as necessary, to aid in minimizing the negative impacts caused by wild hog populations on the area.

4.5.3 Non-native Species Activities and Accomplishments

Invasive plant species known to occur include mimosa (*Albizia julibrissin*), air-potato (*Dioscorea bulbifera*), common water hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), cogongrass, Chinese privet (*Ligustrum sinense*), and others (Table 4). During the previous planning period, FWC staff worked to survey and control non-native plant and wildlife species found. 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 AWMA for the next 10 years are further detailed in Sections 5 and 6.

- Approximately 58 acres of invasive non-native plants have successfully reached the maintenance rotation phase.
- The FWC continues to offer hunts for control of the wild hog population

4.6 Public Access and Recreational Opportunities

To facilitate fish and wildlife-focused outdoor recreational opportunities on the area, the FWC has continued to establish and maintain hiking trails, kiosks, and boat landings (Figure 10).

In addition to recreational opportunities on the AWMA, 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 ADA⁷ 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 AWMA. To accomplish this, the FWC will develop a Public Access Assessment for the AWMA 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 AWMA 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 AWMA can currently support 1,261 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 revisions to the carrying 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 AWMA:

- Five footbridges at Western Sloughs and one foot bridge along the FNST were replaced.
- A BioBlitz event was held in 2017.
- FWC staff coordinated with the FTA to maintain a six-mile section of the FNST.
- 120 miles of public use roads were maintained.
- New hunting days were established.

4.7 Hydrological Preservation and Restoration

A Hydrological Assessment was completed on the AWMA in 2005 (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 AWMA, 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 several hydrological restoration and improvement activities on the AWMA, including:

- A new low water crossing was installed.
- 29 culverts were replaced, and five new ones were installed.

4.8 Forest Resource Management

A Timber Management Plan of the timber resources of the AWMA has been conducted by the FFS (Appendix 11.17). The management of timber resources will be considered in the context of the Timber Management Plan and the overall land management goals and activities.

Pursuant to OBVM management goals, the FWC will manage timber resources for wildlife benefits and natural community restoration. Management activities, including 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 AWMA, including:

- In 2025, a timber inventory was completed.
- Approximately 3,671 acres of timber were harvested.
- Longleaf pine planting was completed on approximately 450 acres.

4.9 Cultural Resources

A review of the FMSF indicates that 331 cultural resources have been recorded on the AWMA (Section 2.8 and Appendix 11.12). Additionally, 13 cultural resource surveys have been conducted on the area. During the previous planning period, 858 monitoring events were completed on approximately 180 archaeological sites. In cooperation with the DHR, the FWC will monitor and report on recorded sites.

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 AWMA. 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* found in Appendix 11.18, 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 AWMA, the FWC will prepare and submit all necessary documentation to the FMSF.

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 AWMA include an equipment storage compound facility, five entrance facilities, two boat landings, and a picnic pavilion. During the previous 10-year planning period, a new shop building was constructed on the AWMA. 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.

4.11 Land Conservation and Stewardship Partnerships

Land conservation and stewardship partnerships can create 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 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 variability 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, as well as 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 fish and wildlife-related assistance with land use planning and habitat management. In addition, the LAP works with landowners to enroll in NRCS conservation cost-share programs to assist with the implementation of wildlife-friendly land management practices. There are many forms of assistance that include technical, financial, and educational, as well as 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 AWMA. 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 AWMA and surrounding areas include SRWMD, Northwest Florida Water Management District, FDACS-FFS, the USFWS, Jefferson County, Taylor County, Leon County, DEP, TNC, Tall Timbers Research Inc., 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 the acquisition of identified lands.

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 P2000 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 approximately 42,121 acres, have been identified for recommended acquisition under the auspices of the FWC's Additions and Inholdings Acquisition program for the AWMA (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 AWMA 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 of the remaining lands within the 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 conservation-based goals and objectives for Florida's future.

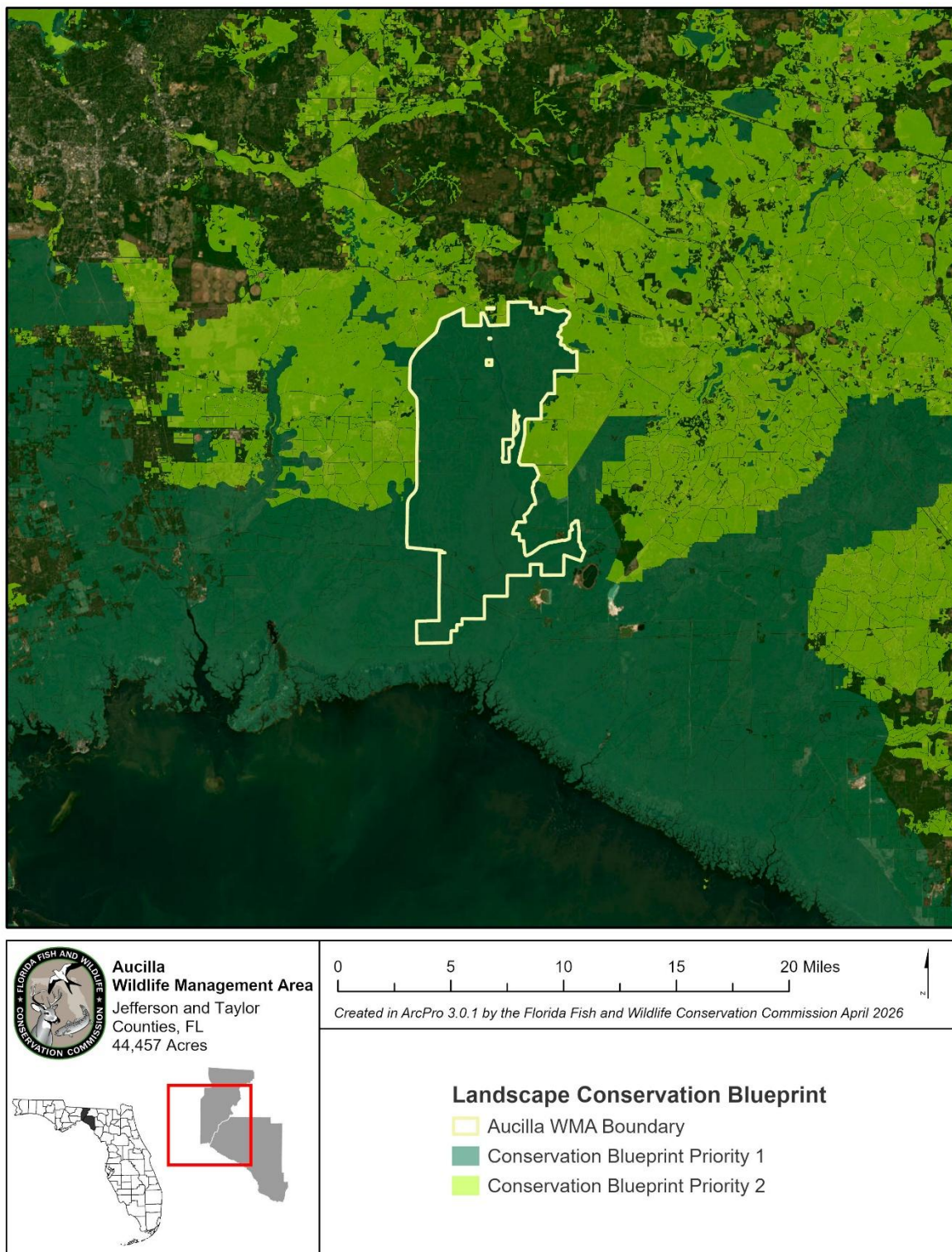


Figure 12. Landscape Conservation Blueprint

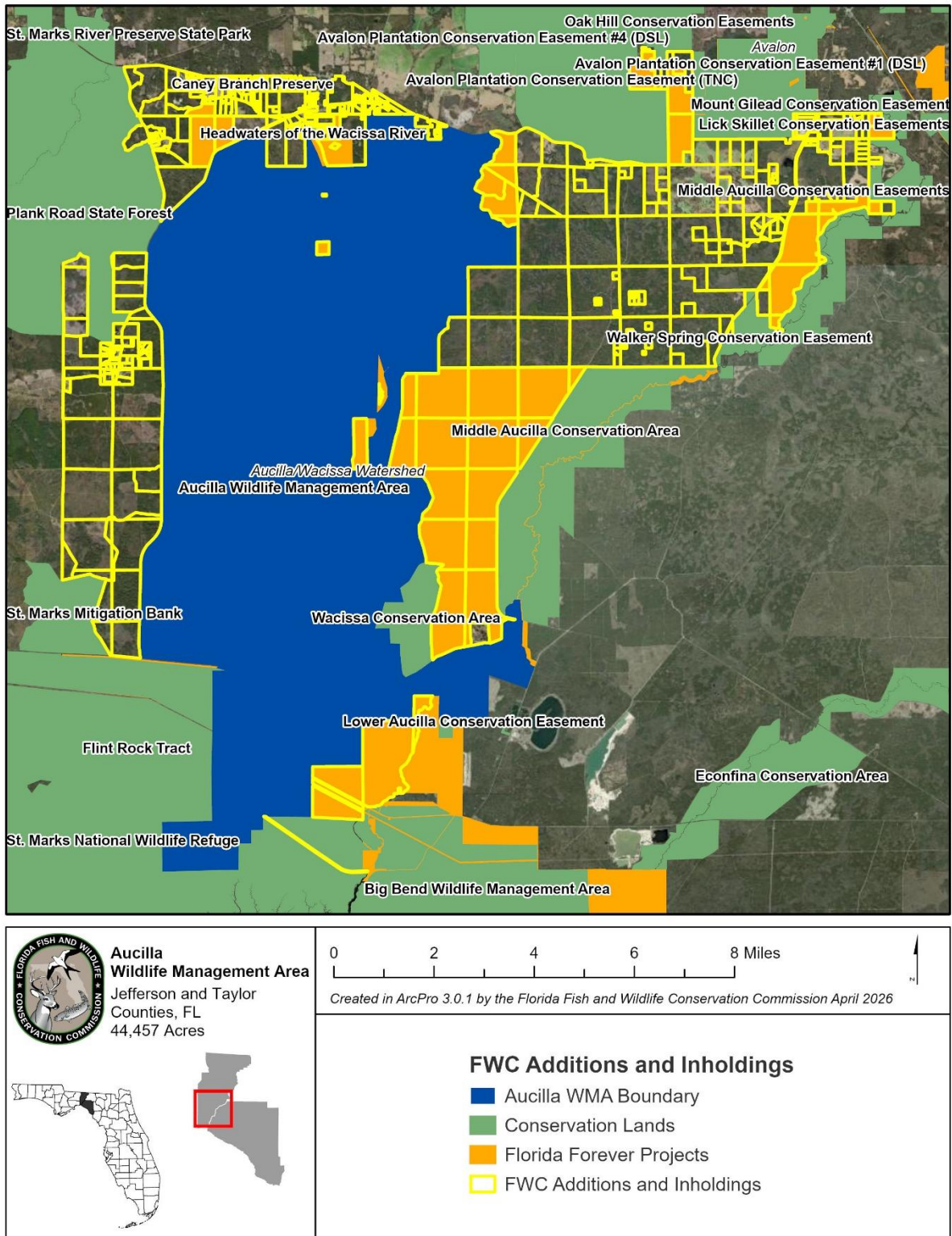


Figure 13. FWC Additions and Inholdings

4.12 Research Opportunities

The FWC intends to cooperate with researchers, universities, and others as feasible and appropriate. For the AWMA, the FWC will continue to assess and identify research and environmental education partnership opportunities as appropriate. All research activities must have prior approval from the FWC.

4.12.1 Research Opportunities Activities and Accomplishments

Research activities conducted on the AWMA during the previous 10-year planning period include:

- FWC staff coordinated with Florida State University, Texas Agricultural and Mechanical University, and Aucilla Research Institute to conduct various research projects on the area's archaeological sites.
- Several Special Use Other permits were approved for various research and survey projects that were conducted by the United States Geological Survey Wetland & Aquatic Research Center, University of Florida (UF) Wisely Lab, UF Howard T. Odum Center for Wetlands, UF McGuire Center for Lepidoptera & Biodiversity, Florida Museum of Natural History, FNAI, Amphibian and Reptile Conservancy, The Orianne Society, Florida Geological Survey, University of Montreal, Xerces Society for Invertebrate Conservation, and Texas Tech University.

4.13 Cooperative Management and Special Uses

4.13.1 Cooperative Management

The FWC is responsible for the overall management and operation of the AWMA as set forth in the lease agreements with the Board of Trustees, the FFS, and the SRWMD. In keeping with the lease agreements 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 11.18) are followed regarding any ground-disturbing activities. In addition, the FFS is a designated cooperating agency and assists the FWC by providing technical assistance on prescribed burning and forest resource management. Also, 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 AWMA.

4.13.2 First Responder and Military Training

First-responder and military training are conditionally allowed on the AWMA. 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 AWMA 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 AWMA.

4.13.3 Apiaries

Currently, four apiaries operate on the AWMA. The use of apiaries is conditionally approved for the AWMA, 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 AWMA will be guided by the FWC Division of Habitat and Species Conservation's Apiary Policy (Appendix 11.19).

4.14 Soil 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.

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 AWMA. 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.

Short-term

1. Contract for recertification of mapping of historic and current natural communities.

Long-term

1. Utilize OBVM monitoring to evaluate actively managed natural communities.
2. Continue to implement the Prescribed Burn Plan.
3. Continue to conduct habitat/natural community improvement including understory control using mechanical and chemical treatments as needed.
4. Continue to conduct habitat/natural community restoration activities on the area by establishing appropriate native warm season grasses.
5. Continue to maintain fire adapted communities on the area within a appropriate fire return intervals.

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

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

Long-term

1. Update and continue to implement the WCPR Strategy by managing identified habitats and monitoring imperiled species.
2. Continue to monitor and protect imperiled plant species on the area.
3. Continue to document new occurrences of imperiled plant species and enter them into the FWC Survey and Monitoring Protocol database.
4. Continue to collect and record opportunistic wildlife species occurrence data.
5. Continue to restore disturbed ephemeral wetlands in burn unit 14 for pond breeding amphibians, with a focus on the frosted flatwoods salamander.

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. Revise and update the WCPR Strategy.

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 the AWMA for the level of infestation of FISC Category I and Category II invasive plant species and treat as needed and appropriate (Table 5).
2. Continue to coordinate with Jefferson County staff to treat cogongrass infestations at the rock mine adjacent to the AWMA.
3. Ensure that staff are familiar with the identification, reporting procedures, and control measures of high priority non-native wildlife species.
4. 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.
2. Explore potential volunteer projects for assisting with Management Plan goals as needed.
3. Maintain public access and recreational opportunities including hunting, fishing, horseback riding, paddling, hiking, and wildlife watching in accordance with the applicable public access and land use rules and laws, to allow for a recreational carrying capacity of 1,261 visitors per day, as determined sustainable and appropriate based on visitor experience and resource impacts.
4. Continue to provide a total of one interpretive or educational program for conservation, which includes WildQuest.
5. Continue to provide a website, recreation guide, and interpretive signs for the area.
6. Stabilize Calico Landing and Welaunee Landing to improve paddling and boat access as appropriate.

7. Continue assessing and improving ADA accessibility for recreation and conservation education programming, as needed.
8. Continue to coordinate with the FTA to manage and maintain the FNST on AWMA.
9. Explore potential trail connections with neighboring conservation lands.

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. Implement hydrological restoration plan as appropriate, including installing/replacing low-water crossings, bridges, and culverts.
2. Maintain/replace existing hydrologic infrastructure, as needed.
3. If necessary, continue to cooperate with partner agencies 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 Timber Management Plan including reforestation, harvesting, and prescribed burning activities based on restoration and maintenance needs of the natural communities and other goals established for management of the AWMA.
2. Continue to conduct timber harvests for the purpose of habitat restoration.
3. 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 when designing site plans for development of infrastructure if necessary.
2. 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.
3. Continue to monitor, protect, preserve, and report any changes on recorded site(s) on the AWMA in accordance with DHR's recommendations.
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.

Long-term

1. Monitor trails and infrastructure annually for visitor impacts.
2. Continue to maintain, repair, replace, or improve facilities and maintain public use roads.
3. Conduct a boundary survey of inholdings if necessary.

5.10 Land Conservation and Stewardship Partnerships

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

Short-term

1. Conduct Bachman's sparrow (*Peucaea aestivalis*) call-back surveys on the AWMA to assist Tall Timbers with monitoring efforts in the Apalachicola Regional Stewardship Alliance (ARSA) region.

Long-term

1. Continue to identify and evaluate potential important wildlife habitat, landscape-scale linkages, wildlife corridors, and operational management needs for AWMA as appropriate and necessary.
2. Continue to contact and inform adjoining private landowners about the FWC LAP, and coordinate with public entities to pursue conservation stewardship partnerships.
3. Continue to evaluate and identify FWC inholdings and additions priority parcels for potential conservation acquisition and pursue acquisitions as funding allows.
4. Continue to maintain a GIS shapefile and other necessary data to facilitate nominations for the FWC landowner assistance and conservation acquisition programs.
5. Continue to identify potential non-governmental land stewardship organization partnerships and grant program opportunities.
6. Determine the efficacy of conducting a landowner assistance/conservation stewardship partnership workshop(s) and pursue as necessary and appropriate.
7. Continue to evaluate and determine if any portions of AWMA 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 AWMA 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 AWMA.
3. Maintain compliance with all current agreements and easements, specifically those with SRWMD (Cooperative Management), TNC (access), Progress Energy (utility), SJPC (conveyance), FTA (MOA), and Florida Power Corporation (easement).

6 Resource Management Challenges and Strategies

The following section identifies and describes further management needs and challenges associated with the AWMA 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: Currently there is no source of native groundcover on the area that can be utilized to accomplish future groundcover restoration goals at scale.

Strategy: Identify a suitable site on the AWMA where a groundcover donor site can be established.

Strategy: Leverage partnerships with ARSA, United States Forest Service, and the USFWS to utilize donor sites on federal lands and solicit assistance in the form of equipment and manpower to collect native groundcover seed for restoration at AWMA.

Challenge 2: There are inholdings within the AWMA that can cause management challenges.

Strategy: Explore conservation strategies for the inholdings, including, but not limited to, fee simple or less-than-fee acquisition to ensure long term conservation of the site.

Strategy: Maintain inholdings within the FWC Additions and Inholdings Acquisition List.

Strategy: Coordinate with existing landowners regarding management of non-native plant species.

Challenge 3: Previous land uses have resulted in population declines or extirpation of several management responsive WCPR species of local importance.

Strategy: Explore the long-term need and feasibility of reintroducing WCPR species of local importance that have been extirpated from the AWMA.

7 Cost Estimates and Funding Sources

The following represents the actual and unmet budgetary needs for managing the lands and resources of the AWMA. 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 development of fixed capital facilities. Funds needed to protect and manage the property and to fully implement the recommended program are derived primarily from the Land Acquisition Trust Fund and from State Legislative appropriations. However, private conservation organizations may be cooperators with the agency for funding of specific projects. Alternative funding sources, such as monies available through grants and potential project-specific mitigation, may be sought to supplement existing funding as needed.

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 AWMA. Cost estimate categories are those currently recognized by the FWC and the Land Management Uniform Accounting Council. More information on these categories, as well as the Fiscal Year 2026/2027 operational plan showing detailed cost estimates by activity and categories of expenditures, may be found in Appendices 11.20 and 11.21.

AWMA Management Plan Cost Estimate*Maximum expected one-year
expenditure*

<u>Resource Management</u>	<u>Expenditure</u>
Prescribed Burning	\$121,828
Invasive Species Control	\$10,305
Cultural Resource Management	\$8,075
Timber Management	\$11,765
Hydrological Management	\$78,807
Vegetation Monitoring/Management	\$136,546
Wildlife Monitoring/Management	\$39,016
Subtotal	\$406,343
 <u>Administration</u>	
General Administration	\$9,694
 <u>Support</u>	
Land Management Planning	\$19,881
Management Reviews	\$10,719
Training/Staff Development	\$22,648
Vehicle Purchase	\$215,976
Vehicle Operation and Maintenance	\$120,571
Other (Technical Reports, Data Management, etc.)	\$37,477
Internal Program Review	\$0
Technology and Data Management	\$14,335
Subtotal	\$441,579
 <u>Capital Improvements</u>	
New Facility Construction	\$0
Facility Maintenance	\$292,070
Subtotal	\$292,070
 <u>Visitor Services/Recreation</u>	
Info./Education/Operations	\$16,128
 <u>Law Enforcement</u>	
Resource protection	\$35,926
 Total	\$1,201,740

* Based on the characteristics and requirements of this area, 9 FTE positions would be optimal to fully manage this area. All land management funding is dependent upon annual legislative appropriations.

AWMA Management Plan Cost**Estimate***10-year projection*

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>	<u>Priority schedule:</u>
Prescribed Burning	\$116,519	(1)	(1) Immediate (annual)
Invasive Species Control	\$1,377,480	(1)	
Cultural Resource Management	\$91,296	(1)	(2) Other (5+ years)
Timber Management	\$133,029	(1)	
Hydrological Management	\$891,048	(1)	
Vegetation Monitoring/Management	\$1,543,893	(1)	
Wildlife Monitoring/Management	\$441,148	(1)	
Subtotal	\$4,594,416		
<u>Administration</u>			
General Administration	\$109,607	(1)	
<u>Support</u>			
Land Management Planning	\$224,785	(1)	
Management Reviews	\$121,204	(2)	
Training/Staff Development	\$256,075	(1)	
Vehicle Purchase	\$2,441,992	(2)	
Vehicle Operation and Maintenance	\$1,363,268	(1)	
Other (Technical Reports, Data Management, etc.)	\$423,411	(1)	
Internal Program Review	\$0	(1)	
Technology and Data Management	\$162,091	(1)	
Subtotal	\$4,992,828		
<u>Capital Improvements</u>			
New Facility Construction	\$0	(2)	
Facility Maintenance	\$3,302,363	(1)	
Subtotal	\$3,302,363		
<u>Visitor Services/Recreation</u>			
Info./Education/Operations	\$182,357	(1)	
<u>Law Enforcement</u>			
Resource protection	\$406,203	(1)	
Total	\$13,587,773	*	

* Based on the characteristics and requirements of this area, 9 FTE positions 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, 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 AWMA 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. 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 AWMA in compliance with Chapter 388.4111, F.S. (Appendix 11.22). This plan was developed in cooperation with the local

Florida Fish and Wildlife Conservation Commission | AWMA Management Plan

Jefferson County and Taylor County arthropod control agencies. This plan is also in conformance with the Local Government Comprehensive Plans as approved and adopted for Jefferson and Taylor counties, Florida (Appendix 11.23).

10 Endnotes

1. Florida Geological Survey, Florida Department of Environmental Protection. Available [online](#). Accessed [2026].
2. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions. Available online. Accessed [2026].
3. Administration, N. O. (n.d.). Climate at a Glance. Retrieved from NOAA: National Centers for Environmental Information [Time Series](#).
4. 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.
5. Wilhere, G. F. 2002. Adaptive management in habitat conservation plans. *Conservation Biology* 16: 20-29.
6. Walters, C. J. and R. Hilborn. 1978. Ecological optimization and adaptive management. *Annual Review of Ecology and Systematics* 9: 157–188.
7. Architectural and Transportation Barriers Compliance Board on Final Accessibility Guidelines for Outdoor Developed Areas, Final Report (2013).

11 Appendices

11.1 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, vegetation 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 significant, non-recurring alterations to structure or species composition are needed for ecological restoration. Invasive exotic plants or animals are absent or 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, clear-cut 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 biodiversity, productivity, 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.

11.2 Lease Agreement 3590

11.2.1 Parent Lease 3590

MULTIPLE AGENCY MANAGEMENT LEASE
FOR
WACISSA-AUCILLA

(1) 3590

LEASE NO. 770-0012

THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, referred to herein as the "Board" and the STATE OF FLORIDA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF STATE LANDS, referred to herein as "State Lands", as agent for the Board, do hereby grant to the STATE OF FLORIDA GAME AND FRESH WATER FISH COMMISSION, referred to herein as the "Commission", the STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, DIVISION OF FORESTRY, referred to herein as "Forestry", management responsibilities for the Wacissa/Aucilla Tract located in Jefferson and Taylor Counties, Florida, described as follows and subject to all existing encumbrances:

(See exhibit "A" attached hereto and made a part hereof)

TO HAVE AND TO HOLD the above described property for a period of fifty (50) years.

WITNESSETH:

The Board, the Commission, and Forestry, for and in consideration of the covenants hereinafter contained, do hereby covenant as follows:

1. The lands shall be managed in accordance with a management plan to be prepared pursuant to Section 253.034, Florida Statutes and presented to the Board for approval within twelve (12) months of the date of this lease. The management plan shall emphasize the original management concept as approved by the Board at the time of acquisition and which established the primary purpose for which this tract was acquired. Activities of the parties shall be governed by and in compliance with the

See Mgmt Agreement
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770-0012

LEASE NO. 770-0012

Management Plan.

2. The Commission shall be the primary managing agency. As such, it shall coordinate and oversee all activities on the property; initiate appropriate management programs to meet the intent of the goals and objectives stated herein; coordinate preparation and periodic revision of the Management Plan; coordinate and monitor all management activities undertaken by others; and, compile and submit such reports as may be required of the managing agencies.

3. The Commission shall: provide a permanent staff position, as funding is acquired, to plan and supervise management of the property; administer and regulate campsites if camping is permitted; manage wildlife; regulate hunting, fishing and nongame activities; and, patrol and provide required law enforcement to prevent unauthorized activities, to protect threatened and endangered species, and to protect archaeological and historic sites, if any, from looting and other unauthorized activities.

4. Forestry shall: provide advice and on-site assistance to The Commission in implementing a prescribed burning program; respond to and take charge of any wildfire and, oversee any timber planting and harvesting activities based on a consensus reached by all participating managing agencies.

5. Any management conflict between any of the managing agencies shall be resolved, if possible, by consensus of the primary managing agency and the affected managing agencies which are parties to this Lease. If a consensus cannot be reached, conflicts shall be submitted through State Lands to the Board for resolution.

6. It is understood by all parties that all management activities specified by this Lease shall be designated to

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conserve, protect and preserve the lands covered by this Lease as provided for by Chapter 259, Florida Statutes.

7. It is further understood and agreed that in addition to the management responsibilities specified herein, the following will be applicable:

- A. A Management Plan for this tract shall be prepared by the primary managing agency, in accordance with Section 253.034, Florida Statutes and in cooperation with the other managing agencies, and shall be submitted to the Board for approval through State Lands, acting as agent for the Board.

The approved Management Plan shall provide the basic guidance for all management activities and shall be reviewed jointly by the managing agencies and the Board at no greater than five-year intervals. Annual work plans and management activities shall be reviewed by the primary managing agency prior to implementation and submitted to State Lands on an annual basis.

- B. The managing agencies shall not use or alter the property except as provided for in the approved Management Plan without the advance written approval of State Lands, acting as agent for the Board. Any managing agency proposing an activity that requires physical alteration of the property shall notify the primary managing agency prior to initiating that activity. The primary managing agency, in turn, shall notify other affected managing agencies.

- C. After discussion with and concurrence by the managing agencies, agreements for compatible use of the property by other parties during the life of this lease may be granted, subject to the review and approval of the Division of State Lands acting

LEASE NO. 770-0012

as agent for the Board.

- D. The Board, or its duly authorized agent, may at any time inspect the works and operation of the managing agencies in any matter pertaining to this Lease. Should any agency fail to keep or perform any of its responsibilities as designated by the Management Plan or program provided for herein, the Board shall notify the specific agency(ies) of such non-performance. If correction or justification is not made after sixty days of receipt of written notice, the Board may terminate any agency's participation in the Lease by providing thirty days written notice of such pending action. Any notice will be in writing from the Director of the Division of State Lands, as agent for the Board.
- E. This Lease shall remain in effect until such time as the Board may terminate it in recognition of a greater public purpose consistent with Chapter 259, Florida Statutes. If a greater public purpose should be determined, the Board, in consultation with the managing agencies, shall have the right to amend or terminate this Lease by providing a reasonable time period to effectuate such an amendment or termination of activities. Any notice of such action shall be in writing from the Director of the Division of State Lands, as agent for the Board. Each agency herein shall have the right to terminate its participation in this management lease upon 60 days written notice to the Board and shall have up to 6 months to conclude its activities hereunder.
- F. The Commission shall make no alteration of that part of the subject land lying within 300 feet of the Florida Trail or the Wacissa River state canoe trail that would disturb or further disturb natural conditions, without the advance written approval of State Lands.

LEASE NO. 770-0012

G. The parties acknowledge that, because the Department of Natural Resources may commence operation of a park at the site known as Goose Pasture adjacent to the Wacissa River and adjacent to the subject lands, State Lands may deem it necessary to withdraw lands in Sections 19 and 30, T3S, R4E, for transfer to the management jurisdiction of the Department of Natural Resources as a part of the park.

8. Execution of this agreement 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 historical sites on state-owned lands is prohibited unless prior authorization has been obtained from the Division of Historical Resources, Department of State. The land 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 tract.

9. The Land 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 Land Management Plan.

10. This Lease and any rights and privileges contained herein are for the sole use of the managing agencies and shall not be assigned or transferred to another party without the advance approval of the Board. The managing agencies shall have the right to enter and occupy the property for the purposes necessary to meet their designated responsibilities, including protection of the property. The agencies' agents and employees shall take all reasonable measures to provide security against property damage, property degradation and unauthorized uses.

11. The managing agencies agree to assist in the investigation of injury or damage claims either for or against the State or the Board pertaining to their respective areas of

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responsibilities, or arising out of their respective management programs and activities, and to contact the lead agency regarding whatever legal action they deem appropriate to remedy same.

IN TESTIMONY WHEREOF, the lawfully designated agent of the Board of Trustees of the Internal Improvement Trust Fund has hereunto subscribed his name and has caused the official seal of said Board to be hereunto affixed, in the City of Tallahassee, Florida, on the 19 day of May, 1988.

(SEAL)
BOARD OF TRUSTEES
OF THE INTERNAL
IMPROVEMENT TRUST
FUND OF THE STATE
OF FLORIDA

Daniel T. Crabb
Witness

Virginia S. Curry
Witness

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

By:

Kumaller
DIRECTOR, DIVISION OF STATE
LANDS, DEPARTMENT OF
NATURAL RESOURCES, AGENT
FOR THE BOARD OF TRUSTEES
OF THE INTERNAL IMPROVEMENT
TRUST FUND OF THE STATE OF
FLORIDA

STATE OF FLORIDA
COUNTY OF LEON

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgment, personally appeared P.W. Munn to me known to be the person described in and who executed the foregoing instrument and has acknowledged before me that he executed the same.

WITNESS my hand and official seal in the County and State last aforesaid the 19 day of May, 1988.

Approved as to Form
and Legality

James Roberts
DNR Attorney

Approved for Compliance
with Chapter 253.03, F.S.

By: Catherine Daniels

Violet L. Davis
Notary Public

My Commission Expires:

NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. AUG 18, 1989
BUNDLED THRU GENERAL INS. UND.

STATE OF FLORIDA GAME AND
FRESH WATER FISH COMMISSION

By:

Robert M. Brantly
Colonel Robert M. Brantly
Executive Director

Les J. Rybak
Witness

Marilyn Davis
Witness

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

McCall
Commission Attorney

APPROVED AS FISCALLY
AND BUDGETARILY SOUND

William C. Sumner
DIRECTOR
DIVISION OF ADMINISTRATIVE SERVICES
GEWFC

Page 6 of 7

LEASE NO. 770-0012

STATE OF FLORIDA
COUNTY OF LEON

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgment, personally appeared Robert M. Groatly, to me known to be the person described in and who executed the foregoing instrument and has acknowledged before me that he executed the same.

WITNESS my hand and official seal in the County and State last aforesaid this 8th day of April, 19 88.

Rosemary Mann

Notary Public, State of Florida
My Commission Expires Oct. 20, 1991
Bonded Thru Terry Fain - Insurance Inc.

Diane K. Foster
Witness

Burkham B. Wilkin
Witness

STATE OF FLORIDA DEPARTMENT OF
AGRICULTURE AND CONSUMER
SERVICES, DIVISION OF FORESTRY

By: Doyle Bonner

Approved as to form and legality

By: Leslie K. Leod, Jr.
Senior Attorney.

STATE OF FLORIDA
COUNTY OF LEON

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State aforesaid and in the County aforesaid to take acknowledgment, personally appeared _____, to me known to be the person described in and who executed the foregoing instrument and has acknowledged before me that he executed the same.

WITNESS my hand and official seal in the County and State last aforesaid this 4th day of May, 19 88.

Diane K. Foster
Notary Public

My Commission Expires:

Notary Public, State of Florida
My Commission Expires June 13, 1989
Bonded Thru Terry Fain - Insurance Inc.

11.2.2 Lease 3590-A1

ATL1

8,666.7 Acres

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT

TRUST FUND OF THE STATE OF FLORIDA

AMENDMENT NUMBER 1 TO LEASE NUMBER 3590

WACISSA-AUCILLA SINKS

THIS LEASE AMENDMENT is entered into this 21st day of May, 2001, by and between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "Board," and the FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (formerly State of Florida Game and Fresh Water Fish Commission), hereinafter referred to as "Commission," and the STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, hereinafter referred to as "Forestry";

W I T N E S S E T H

WHEREAS, the Board, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 19, 1988, the Board, Commission, and Forestry entered into Lease Number 3590; and

WHEREAS, the Board, Commission, and Forestry desire to amend the lease to add land to the leased property.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 3590 is hereby amended to include the real property described in Exhibit "A," attached hereto, and by reference made a part hereof. Unless stated otherwise, all legal descriptions and exhibits of or related to Lease No. 3590, as amended, include all sovereignty lands which are located within the property described therein.

2. It is understood and agreed by the Board, Commission, and Forestry that in each and every respect the terms of the Lease Number 3590 except as amended shall remain unchanged and in full

force and effect and the same are hereby ratified, approved and confirmed by the Board, Commission, and Forestry.

IN WITNESS WHEREOF, the parties have caused this Lease Amendment 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

Trace Peters
Witness

Trace Peters
Print/Type Witness Name

Fredrica W. Jones
Witness

Fredrica W. Jones
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

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

"Board"

The foregoing instrument was acknowledged before me this 24th day of May, 2001, by Gloria C. Nelson, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. She is personally known to me.

Florence L. Davis
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:



Florence L. Davis
MY COMMISSION # CC974560 EXPIRES
October 11, 2004
BONDED THROUGH FARM INSURANCE, INC.

Approved as to Form and Legality

By: Amel Hama
DEP Attorney

STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE
AND CONSUMER SERVICES

Lee Sadler
Witness

Lee Sadler
Print/Type Witness Name

Ida Daniels
Witness

Ida Daniels
Print/Type Witness Name

By: Mike Gresham (SEAL)

Mike Gresham
Print/Type Name
Title: Director of Administration

"LESSEE"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this
21st day of February, 2021, by MIKE GRESHAM
as DIRECTOR OF ADMINISTRATION, of the State of Florida Department
of Agriculture and Consumer Services. He/she is personally known
to me.



Karen A. Meyer
MY COMMISSION # CC749622 EXPIRES
October 20, 2004
BONDED THRU TROY FARM INSURANCE, INC.

Karen A. Meyer
Notary Public, State of Florida
KAREN A. MEYER
Print/Type Notary Name

Commission Number:

Commission Expires:

STATE OF FLORIDA FISH AND
WILDLIFE CONSERVATION COMMISSION

Brenda Collini
Witness

B Collini
Print/Type Witness Name

Cynthia Ward
Witness

Cynthia Ward
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
30th day of October, 2000, by Victor J. Heller
as Assistant Executive Director of the State of Florida Fish and
Wildlife Conservation Commission. He/~~she~~ is personally known to
me.

Jimmie C. Bevis
Notary Public, State of Florida
JIMMIE C. BEVIS
Print/Type Notary Name

Commission Number My Commission # CC702862 EXPIRES
December 28, 2001
Commission Expires BONDED THRU TROY FAIR INSURANCE, INC.

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
D. I. [Signature]
Commission Attorney

11.2.3 Lease 3590-A2

ATL1

13,917.18 Acres

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT

TRUST FUND OF THE STATE OF FLORIDA

AMENDMENT NUMBER 2 TO LEASE NUMBER 3590

WACISSA-AUCILLA SINKS

THIS LEASE AMENDMENT is entered into this 15th day of June, 2003, by and between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "Board," and the FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (formerly State of Florida Game and Fresh Water Fish Commission), hereinafter referred to as "Commission," and the STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, hereinafter referred to as "Forestry";

W I T N E S S E T H

WHEREAS, the Board, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 19, 1988, the Board, Commission, and Forestry entered into Lease Number 3590; and

WHEREAS, the Board, Commission, and Forestry desire to amend the lease to add land to the leased property.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 3590 is hereby amended to include the real property described in Exhibit "A," attached hereto, and by reference made a part hereof. Unless stated otherwise, all legal descriptions and exhibits of or related to Lease No. 3590, as amended, include all sovereignty lands which are located within the property described therein.
2. It is understood and agreed by the Board, Commission, and Forestry that in each and every respect the terms of the Lease

Number 3590 except as amended shall remain unchanged and in full force and effect and the same are hereby ratified, approved and confirmed by the Board, Commission, and Forestry.

IN WITNESS WHEREOF, the parties have caused this Lease Amendment 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

[Signature]
Witness

Trina Potts
Print/Type Witness Name

[Signature]
Witness

Judy Woodward
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

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

"Board"

13th The foregoing instrument was acknowledged before me this day of July, 2003 by Gloria C. Nelson, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. She is personally known to me.

[Signature]
Notary Public, State of Florida

Print/Type Notary Name Diane C. Rogowski
MY COMMISSION # DC113320 EXPIRES
Commission Number May 24, 2006
BONDED THRU TROY FARM INSURANCE, INC.

Commission Expires:

Approved as to Form and Legality

By: [Signature]
DEF Attorney

STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE
AND CONSUMER SERVICES

Chrissie Hackney
Witness

Chrissie Hackney
Print/Type Witness Name

Angelia B. Rains
Witness

Angelia B. Rains
Print/Type Witness Name

By: Mike Gresham (SEAL)

Mike Gresham
Print/Type Name

Title: Director of Administration

"LESSEE"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this
16th day of June, 2003, by Mike Gresham
as Director of Admin, of the State of Florida Department
of Agriculture and Consumer Services. He is personally known
to me.



Karen A. Meyer
MY COMMISSION # CC949622 EXPIRES
October 20, 2004
BONDED THRU TROY FARM INSURANCE, INC.

Karen A. Meyer
Notary Public, State of Florida
KAREN A MEYER
Print/Type Notary Name

Commission Number: #CC949622

Commission Expires: 10/20/2004

STATE OF FLORIDA FISH AND
WILDLIFE CONSERVATION COMMISSION

PA Doerr
Witness

PA Doerr
Print/Type Witness Name

Sarah Williams
Witness

Sarah Williams
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

By: Timothy A. Breaugh (SEAL)

Timothy A. Breaugh
Print/Type Name

Title: Assistant Division Director
Division of Wildlife

"LESSEE"

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

[Signature]
Commission Attorney

The foregoing instrument was acknowledged before me this
24th day of May, 2003, by Timothy A. Breaugh
as Asst Division Director, of the State of Florida Fish and
Wildlife Conservation Commission. He/she is personally known to
me.

Florida Parrish
Notary Public, State of Florida

Florida Parrish
Print/Type Notary Name

Commission Number:  Florida Parrish
MY COMMISSION # DD641441 EXPIRES
July 11, 2005
BONDED THRU TROY FARM INSURANCE, INC.

Commission Expires:

11.2.4 Lease 3590-A3

ATL1

4,692.94 Acres

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT

TRUST FUND OF THE STATE OF FLORIDA

FDACS CONTRACT #

005010

AMENDMENT NUMBER 3 TO LEASE NUMBER 3590

WACISSA-AUCILLA SINKS

THIS LEASE AMENDMENT is entered into this 29th day of April, 2004, by and between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "Board," and the FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (formerly State of Florida Game and Fresh Water Fish Commission), hereinafter referred to as "Commission," and the STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, hereinafter referred to as "Forestry";

W I T N E S S E T H

WHEREAS, the Board, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 19, 1988, the Board, Commission, and Forestry entered into Lease Number 3590; and

WHEREAS, the Board, Commission, and Forestry desire to amend the lease to add land to the leased property.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 3590 is hereby amended to include the real property described in Exhibit "A," attached hereto, and by reference made a part hereof. Unless stated otherwise, all legal descriptions and exhibits of or related to Lease No. 3590, as amended, include all sovereignty lands which are located within the property described therein.

2. It is understood and agreed by the Board, Commission, and Forestry that in each and every respect the terms of the Lease

Number 3590 except as amended shall remain unchanged and in full force and effect and the same are hereby ratified, approved and confirmed by the Board, Commission, and Forestry.

IN WITNESS WHEREOF, the parties have caused this Lease Amendment 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

Tracy Peters
Witness

Tracy Peters
Print/Type Witness Name

Judy Woodward
Witness

Judy Woodward
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

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

"Board"

29th day of April, 2004 The foregoing instrument was acknowledged before me this by Gloria C. Nelson, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. She is personally known to me.

Diane C. Rogowski
Notary Public, State of Florida

Print/Type Notary Name Diane C. Rogowski
Commission Number DD113320 MY COMMISSION # DD113320 EXPIRES
May 24, 2006
BONDED THROUGH FAIR INSURANCE, INC.
Commission Expires:

Approved as to Form and Legality

By: Mark L. Hume
DEP Attorney

Christie Hackney
Witness

Christie Hackney
Print/Type Witness Name

Susie P. Burch
Witness

Susie P. Burch
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this
16th day of April, 2004, by Mike Gresham
as Director of Admin., of the State of Florida Department
of Agriculture and Consumer Services. (He) she is personally known
to me.



Karen A. Meyer
MY COMMISSION # CC949622 EXPIRES
October 20, 2004
BONDED THRU TROY FAY INSURANCE, INC.

STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE
AND CONSUMER SERVICES

By: Mike Gresham (SEAL)

Mike Gresham
Print/Type Name

Title: Director of Administration

"LESSEE"

Karen A. Meyer
Notary Public, State of Florida
KAREN A. MEYER
Print/Type Notary Name

Commission Number: #CC949622

Commission Expires: 10/20/2004

STATE OF FLORIDA FISH AND
WILDLIFE CONSERVATION COMMISSION

PA Doerr
Witness

PA Doerr
Print/Type Witness Name

Sarah Williams
Witness

Sarah Williams
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

By: Timothy A Brault (SEAL)

Timothy A. Brault
Print/Type Name

Title: Assistant Division Director
Division of Wildlife

"LESSEE"

APPROVED AS TO
AND LEGAL SUFFICIENCY
[Signature] 8/10/03
Commission Attorney

The foregoing instrument was acknowledged before me this
20th day of August, 2003 by Timothy A Brault
as Asst Division Director, of the State of Florida Fish and
Wildlife Conservation Commission. He/she is personally known to
me.

Florida Parrish
Notary Public, State of Florida
Florida Parrish
Print/Type Notary Name

Commission Number:

Commission Expires:



Florida Parrish
MY COMMISSION # DD041441 EXPIRES
July 11, 2005
BONDED THRU TROY FARM INSURANCE, INC.

11.2.5 Lease 3590-A4

FDACS CONTRACT #

006010

ATL1

10.49 Acres

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT

TRUST FUND OF THE STATE OF FLORIDA

AMENDMENT NUMBER 4 TO LEASE NUMBER 3590

WACISSA-AUCILLA SINKS

THIS LEASE AMENDMENT is entered into this 18th day of May, 2004, by and between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "Board," and the FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (formerly State of Florida Game and Fresh Water Fish Commission), hereinafter referred to as "Commission," and the STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, hereinafter referred to as "Forestry";

W I T N E S S E T H

WHEREAS, the Board, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 19, 1988, the Board, Commission, and Forestry entered into Lease Number 3590; and

WHEREAS, the Board, Commission, and Forestry desire to amend the lease to add land to the leased property.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 3590 is hereby amended to include the real property described in Exhibit "A," attached hereto, and by reference made a part hereof. Unless stated otherwise, all legal descriptions and exhibits of or related to Lease No. 3590, as amended, include all sovereignty lands which are located within the property described therein.
2. It is understood and agreed by the Board, Commission, and Forestry that in each and every respect the terms of the Lease

Number 3590 except as amended shall remain unchanged and in full force and effect and the same are hereby ratified, approved and confirmed by the Board, Commission, and Forestry.

IN WITNESS WHEREOF, the parties have caused this Lease Amendment 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

Tracy Peters
Witness

Tracy Peters
Print/Type Witness Name

Judy Woodard
Witness

Judy Woodard
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

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

"Board"

The foregoing instrument was acknowledged before me this 18th day of May, 2004, by Gloria C. Nelson, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. She is personally known to me.

Sylvia S. Roberts
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:



Sylvia S. Roberts
MY COMMISSION # 00035841 EXPIRES
July 25, 2005
BONDED THRU TROY FARM INSURANCE, INC.

Approved as to Form and Legality

By: Frank J. Hus
DEP Attorney

STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE
AND CONSUMER SERVICES

Angelia B. Rains
Witness

Angelia B. Rains
Print/Type Witness Name

Chrissie Hackney
Witness

Chrissie Hackney
Print/Type Witness Name

By: Mike Gresham (SEAL)

Mike Gresham
Print/Type Name

Title: Director of Administration

"LESSEE"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this
5th day of May, 2004, by Mike Gresham
as Director of Admin., of the State of Florida Department
of Agriculture and Consumer Services. (He) she is personally known
to me.



Karen A. Meyer
MY COMMISSION # CC 949622 EXPIRES
OCTOBER 20, 2004
BONDED THROUGH FARM INSURANCE INC.

Karen A. Meyer
Notary Public, State of Florida
KAREN A. MEYER
Print/Type Notary Name

Commission Number: # CC 949622

Commission Expires: 10/20/2004

11.2.6 Lease 3590-A5

ATL1

80.1 Acres

FDACS CONTRACT #

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

006010

AMENDMENT NUMBER FIVE TO LEASE NUMBER 3590

WACISSA-AUCILLA SINKS

THIS LEASE AMENDMENT is entered into this 12th day of
APRIL, 2007, by and 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, successor in interest to the FLORIDA GAME
AND FRESH WATER FISH COMMISSION, referred to as "COMMISSION"; and the
STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES,
DIVISION OF FORESTRY, herein referred to as "FORESTRY"; collectively
referred to herein as the "MANAGING AGENCIES".

W I T N E S S E T H

WHEREAS, LESSOR, by virtue of Section 253.03, Florida Statutes,
holds title to certain lands and property for the use and benefit of
the State of Florida; and

WHEREAS, on May 19, 1988, LESSOR, COMMISSION, AND FORESTRY
entered into Lease Number 3590; and

WHEREAS, LESSOR, COMMISSION, and FORESTRY desire to amend the
lease to add land to the leased premises.

NOW THEREFORE, in consideration of the mutual covenants and
agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in
Exhibit "A" of Lease Number 3590 is hereby amended to include the
real property described in Exhibit "A," attached hereto, and by
reference made a part hereof.
2. It is understood and agreed by LESSOR, COMMISSION, and FORESTRY
that in each and every respect the terms of the Lease Number 3590,
except as amended, shall remain unchanged and in full force and
effect and the same are hereby ratified, approved and confirmed by
LESSOR, COMMISSION, and FORESTRY.
3. It is understood and agreed by LESSOR, COMMISSION, and
FORESTRY that this Amendment Number 5 to Lease Number 3590 is
hereby binding upon the parties hereto and their successors and
assigns.

IN WITNESS WHEREOF, the parties have caused this Lease amendment 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

Dave Fewell
Witness

DAVE FEWELL
Print/Type Witness Name

Judy Woodward
Witness

Judy Woodward
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

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

"LESSOR"

The foregoing instrument was acknowledged before me this 12th day of APRIL, 2007, by Gloria C. Barber, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, State of Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. She is personally known to me.

Alexandra Alexandre
Notary Public, State of Florida
Print/Type Notary Name

Commission Number:

Commission Expires:



ALEXANDRA ALEXANDRE
Commission ID 637056
Expires February 8, 2011
Bonded thru Tary Faith Insurance 800-385-7019

Approved as to Form and Legality

By: [Signature]
DEP Attorney

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION, successor
in interest to the FLORIDA GAME
AND FRESH WATER FISH COMMISSION

[Signature]
Witness

Russell C Mospens
Print/Type Witness Name

Magda Soliman
Witness

Magda Soliman
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

By: Timothy A. Breault (SEAL)

Timothy A. Breault
Print/Type Name

Title: Director, HSC

"COMMISSION"

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
[Signature]
Commission Attorney

The foregoing instrument was acknowledged before me this 27th
day of March, 2007, by Timothy A. Breault
as Dir HSC, on behalf of the FLORIDA FISH AND
WILDLIFE CONSERVATION COMMISSION, successor in interest to the
FLORIDA GAME AND FRESH WATER FISH COMMISSION. He/she is personally
known to me.

[Signature]
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:



STATE OF FLORIDA DEPARTMENT OF
AGRICULTURE AND CONSUMER SERVICES,
DIVISION OF FORESTRY

Christa A. Register
Witness

Christa A. Register
Print/Type Witness Name

Angelia B. Rains
Witness

Angelia B. Rains
Print/Type Witness Name

By: Mike Gresham (SEAL)

Mike Gresham
Print/Type Name

Title: Director of Administration

"FORESTRY"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 9
day of April, 2007, by Mike Gresham
as Director of Administration, on behalf of DIVISION OF FORESTRY, STATE
OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES. He/she is
personally known to me.



Chander D. Baker
Notary Public, State of Florida

Chander D. Baker
Print/Type Notary Name

Commission Number: DD598131

Commission Expires: 09/24/2010

11.2.7 Lease 3590-A6

ATL1

2,849.20 Acres

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

FDACS CONTRACT #

006010

AMENDMENT NUMBER SIX TO LEASE NUMBER 3590

WACISSA-AUCILLA WMA

THIS LEASE AMENDMENT is entered into this 18th day of August, 2010, by and 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, successor in interest to the FLORIDA GAME AND FRESH WATER FISH COMMISSION, referred to as "COMMISSION"; and the STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, DIVISION OF FORESTRY, herein referred to as "FORESTRY"; collectively referred to herein as the "MANAGING AGENCIES".

W I T N E S S E T H

WHEREAS, LESSOR, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 19, 1988, LESSOR, COMMISSION, AND FORESTRY entered into Lease Number 3590; and

WHEREAS, LESSOR, COMMISSION, and FORESTRY desire to amend the lease to add land to the leased premises.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 3590 is hereby amended to include the real property described in Exhibit "A," attached hereto, and by reference made a part hereof.
2. It is understood and agreed by LESSOR, COMMISSION, and FORESTRY that in each and every respect the terms of the Lease Number 3590, except as amended, shall remain unchanged and in full force and effect and the same are hereby ratified, approved and confirmed by LESSOR, COMMISSION, and FORESTRY.
3. It is understood and agreed by LESSOR, COMMISSION, and FORESTRY that this Amendment Number SIX to Lease Number 3590 is hereby binding upon the parties hereto and their successors and assigns.

IN WITNESS WHEREOF, the parties have caused this Lease amendment 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

Dave Fewell
Witness

DAVE FEWELL
Print/Type Witness Name

Judy Woodard
Witness

Judy Woodard
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

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

"LESSOR"

The foregoing instrument was acknowledged before me this 18th day of AUGUST, 2010, by Gloria C. Barber, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, State of Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. She is personally known to me.



David L. Fewell
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:

Approved as to Form and Legality

By: David L. Fewell
DEP Attorney

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

By: Lawson E. Snyder (SEAL)

LAWSON E. SNYDER
Print/Type Name

Title: Dep Dir Director

[Signature]
Witness

Richard C Mospers
Print/Type Witness Name

Matthew Matlock
Witness

MATTHEW MATLOCK
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

"COMMISSION"

APPROVED AS TO FORM

AND LEGAL SUFFICIENCY

[Signature]
Commission Attorney

The foregoing instrument was acknowledged before me this 17th day of August, 2010, by Lawson E. Snyder, on behalf of the Florida Fish and Wildlife Conservation Commission. He/she is personally known to me.

Jo Ann M. Fain
Notary Public, State of Florida

Jo Ann M. Fain
Print/Type Notary Name

Commission Number:

Commission Expires:



STATE OF FLORIDA DEPARTMENT OF
AGRICULTURE AND CONSUMER SERVICES,
DIVISION OF FORESTRY

Susan P. Burch
Witness

Susan P. Burch
Print/Type Witness Name

Christina Register
Witness

Christina A. Register
Print/Type Witness Name

By Mike Gresham (SEAL)

Mike Gresham
Print/Type Name

Title Director of Administration
"FORESTRY"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 21 day of May, 2010, by Mike Gresham as Director of Administration, on behalf of Division of Forestry, State of Florida Department of Agriculture and Consumer Services. He/she is personally known to me.

Chander D. Baker
Notary Public, State of Florida

Chander D. Baker
Print/Type Notary Name

Commission Number:

Commission Expires:



11.2.8 Lease 3590-A7

This instrument prepared by:
Jay Sirey
Department of Environmental Protection
Bureau of Public Administration
Division of State Lands
3900 Commonwealth Blvd, MS 130
Tallahassee, Florida 32399-3000
AID# 38496

FDACS CONTRACT #

006010

ATL1
[77.99 acres +/-]

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

AMENDMENT NUMBER 7 TO LEASE NUMBER 3590

THIS LEASE AMENDMENT is entered into this 9th day of JANUARY, 2019, by and 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**, successor in interest to the Florida Game and Fresh Water Fish Commission, referred to as "COMMISSION"; and the **STATE OF FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, FLORIDA FOREST SERVICE**, hereinafter referred to as "FORESTRY"; collectively referred to herein as the "MANAGING AGENCIES".

WITNESSETH:

WHEREAS, LESSOR, by virtue of Section 253.03, Florida Statutes, holds title to certain lands and property for the use and benefit of the State of Florida; and

WHEREAS, on May 19, 1988, LESSOR and MANAGING AGENCIES entered into Lease Number 3590 (the "lease"); and

WHEREAS, LESSOR and MANAGING AGENCIES desire to amend the lease to add land to the leased premises.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereto agree as follows:

1. The legal description of the leased premises set forth in Exhibit "A" of Lease Number 3590 is hereby amended to include the real property described in Exhibit "A" attached hereto and by reference made a part hereof.

2. It is understood and agreed by LESSOR and MANAGING AGENCIES that in each and every respect the terms of Lease Number 3590, except as amended, shall remain unchanged and in full force and effect and the same are hereby ratified, approved and confirmed by LESSOR and MANAGING AGENCIES as of the date of this amendment.

3. It is understood and agreed by LESSOR and MANAGING AGENCIES that this Amendment Number 7 to Lease Number 3590 is hereby binding upon the parties hereto and their successors and assigns.

[Remainder of page intentionally left blank; Signature page follows]

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

WITNESSES:

David Lee Fewell
Original Signature

DAVE FEWELL
Print/Type Name of Witness

TERRI D. GROSS
Original Signature

TERRI D. GROSS
Print/Type Name of Witness

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

By: Cheryl C. McCall (SEAL)

Cheryl C. McCall, Chief, Bureau of Public Land
Administration, Division of State Lands, State of
Florida Department of Environmental Protection,
as agent for and on behalf of the Board of Trustees
of the Internal Improvement Trust Fund of the State of
Florida

"LESSOR"

**STATE OF FLORIDA
COUNTY OF LEON**

9 The foregoing instrument was acknowledged before me this 9th day of JANUARY
2018, by Cheryl C. McCall, Chief, Bureau of Public Land Administration, Division of State Lands, State of Florida
Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal
Improvement Trust Fund of the State of Florida. She is personally known to me.

Approved subject to proper execution:

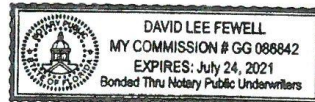
David Lee Fewell 11-05-2018
DEP Attorney Date

David Lee Fewell
Notary Public, State of Florida

Printed, Typed or Stamped Name

My Commission Expires: _____

Commission/Serial No.: _____



FLORIDA FISH AND WILDLIFE CONSERVATION
COMMISSION

WITNESSES:

Lisa Davis
Original Signature

Lisa Davis
Typed/Printed Name of Witness

Sabrina Menendez
Original Signature

Sabrina Menendez
Typed/Printed Name of Witness

By: *Thomas H. Eason* (SEAL)
Eric Sutton, Executive Director

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
Julius P. [Signature]
Commission Attorney

"COMMISSION"

STATE OF FLORIDA
COUNTY OF LEON

Thomas Eason, as Assistant The foregoing instrument was acknowledged before me this 4th day of December, 2018, by Eric Sutton, as Executive Director, for and on behalf of the Florida Fish and Wildlife Conservation Commission. He is personally known to me or has produced _____ as identification.

Emily Davis
Notary Public, State of Florida

Emily Davis
Print/Type Notary Name

Commission Number: GG 274773

Commission Expires: November 6, 2022



WITNESSES:

[Signature]
Original Signature
Elizabeth May
Typed/Printed Name of Witness
[Signature]
Original Signature
Carmelita Bennett
Typed/Printed Name of Witness

STATE OF FLORIDA DEPARTMENT OF
AGRICULTURE AND CONSUMER SERVICES,
FLORIDA FOREST SERVICE

By: [Signature] (SEAL)
Joey B. Hicks, Director, Division of Administration

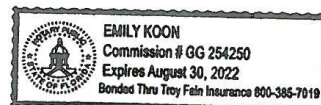
"FORESTRY"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 16th day of November, 2018, by Joey B. Hicks as Director, Division of Administration, for and on behalf of the State of Florida Department of Agriculture and Consumer Services, Florida Forest Service. He is personally known to me.

[Signature]
Notary Public, State of Florida
Emily Koon
Printed, Typed or Stamped Name

Commission/Serial No. GG 254250
My Commission Expires: 8/30/22



Page 5 of 6
Amendment Number 7 to Lease Number 3590
Revised 05/13

11.3 Cooperative Agreement No. 11271

AGREEMENT NUMBER 11271

AGREEMENT ROUTING REVIEW FORM

CONTRACTOR SUWANNEE RIVER WATER MANAGEMENT DISTRICT
 VENDOR ID No. N/A PROCUREMENT METHOD*/BID/RFP No. N/A
 PROJECT TITLE: COOPERATIVE MANAGEMENT AGREEMENT
 ORIGINATOR/CONTACT MATT CHOPP/ROSA TORRES PHONE 617-9546 Div/Ofc/MAIL HGM IR
☒ NEW** ☐ AMENDMENT ☐ RENEWS OR EXTENDS
☐ EXPENDITURE** ☐ REVENUE ☒ AGREEMENT ☐ EASEMENT/DEED ☐ LEASE (INCLUDES WMA OR FMA LEASES)
 AGREEMENT BEGINNING DATE 11/21/2012 END DATE 5 years 11/20/2017 OPTION FOR 5 YEARS
 TOTAL AGREEMENT AMOUNT \$0.00 PAYMENT AMOUNT \$0.00
 BILLING PERIODS: ☐ MONTHLY ☐ QUARTERLY ☐ ANNUALLY ☐ OTHER
 BUILDING INSURANCE TO BE INCURRED BY THE COMMISSION (LEASES) ☐ NO ☐ YES (NOTIFY PROPERTY ADMINISTRATOR)

****NEW EXPENDITURE:** (1) Attach a copy of the State Project checklist or, for Existing State Projects, show the CSFA No. n/a
Contracts (2) Vendor/Recipient Checklist: Attached? ☐ Yes ☒ No - not a State Project per (1) Checklist

ORG. CODE	E.O.	OBJECT CODE	CATEGORY	CAT YEAR	AMOUNT	PROJECT ID	FY

Certified Minority: ☐ Yes ☐ No ☒ Not Available ☐ Not Appl. ☐ Minority Category (See reverse side for options)
 Commodity Code Federal Funds: Agency CFDA N/A

Routing Order for Approval	Approval (Signature)	Date	Comments
Project Leader	<i>Rosa Torres</i>	11/2/12	Budget Sheet is available upon request by external sources. ☐ Yes ☐ No
Budget Director (Expenditure Only)			Budget Authority: ☐ Existing ☐ New
Div./Reg./Inst./Off. Dir./Section Leader	<i>M. Brooks</i>	11-5-12	
Enter Contract into SCMS system	Entered: ☐ Yes ☐ No ☒ N/A		If applicable, enter contract into SCMS system in "Draft" status, as required
Asst. Chief Financial Officer - FSAA Originals	<i>N/A</i>		Send to: Mail Code ID
Contracts Administrator	<i>Randy Chapman</i>	11/08/12	
Legal	<i>Deborah Piro</i>	11/19/12	
Accounting	N/A		Funds Availability: ☐ Yes ☐ No
Exec./Div./Reg./Inst./Off. Dir. review (check below).	N/A		
☐ Expenditure Contracts: Return to Originator for Contractor signature. ☒ Other documents: Send to (circle) Exec./Div./Reg./Inst./Off. Dir. for signature.	N/A		Expenditure Contracts: After Contractor signs, send to Exec./Div./Reg./Inst./Off. Director for signature and dating.
Exec./Div./Reg./Inst. Dir. execute	<i>Randy Chapman</i>	11-21-12	NOTE: If not executed for any reason please notify the Contract Administrator and Accounting
WITHIN THREE (3) DAYS OF CONTRACT EXECUTION THE FOLLOWING STEPS MUST BE DONE:			
Originator to FWC Contract Office	Sent: ☒ Yes ☐ No	11/26/12	Email electronic (.pdf) copy of Contract & Routing Form or send hard copy
Contract Administrator	Updated: ☐ Yes ☒ No		Update status in SCMS system from "Draft" to "Active"
Contract Administrator	Reported: ☐ Yes ☒ No		Report non-competitively procured contracts in excess of Category 2 to DFS
Originator or Contract Administrator to Accounting	Sent: ☐ Yes ☒ No		Mail one (1) hard copy of Contract & Routing Form

FWC 167/rev. 04/11 \SHARE\FORMS\CONROUTE.167

See reverse for Codes/Definitions/Distribution

Randy K. Chapman 11/26/2012

MEMORANDUM

TO: Contract Reviewers

FROM: Rosa Torres, Division of Hunting & Game Management 

DATE: October 31, 2012

SUBJECT: Cooperative Agreement with the Suwannee River Water Management District, FWC Contract No. 11271

Included herewith for your review are two (2) originals of a land management agreement between the Florida Fish and Wildlife Conservation Commission (FWC) and the Suwannee River Water Management District (SRWMD). This agreement consolidates or replaces land management agreements with the SRWMD.

A Map showing the lands to be managed are included in "Exhibit A" within the agreement. Legal descriptions for these areas are contained in the "Area Files" located in the Bryant Building's 3rd floor file room.

Your prompt attention to this matter is appreciated. Should you have any questions, please contact me at 617-9546. Thank you for your assistance.

**COOPERATIVE AGREEMENT
BETWEEN THE
SUWANNEE RIVER WATER MANAGEMENT DISTRICT
AND THE
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION**

This Cooperative Agreement (Agreement) is entered into on November 21, 2012, between the Suwannee River Water Management District, a public body existing under Chapter 373, Florida Statutes, whose mailing address is 9225 County Road 49, Live Oak, FL 32060 (District) and the Florida Fish and Wildlife Conservation Commission, an agency of the State of Florida, whose mailing address is 620 South Meridian Street, Tallahassee, FL 32399-1600 (Commission) (collectively "the Parties," each singularly a "Party").

The District is charged in section 373.1391(1)(b), Florida Statutes, whenever practicable, with making its lands open to the general public for recreational uses, including hunting and fishing.

The District is authorized by sections 373.1391 and 373.1401, Florida Statutes, to enter into contracts with state agencies and other entities to provide for the coordinated and cost-effective management of District lands; and

The Commission is an agency of the State of Florida responsible for the regulation, management, protection, and conservation of Florida's fish and wildlife resources; and

The Commission and the District have several individual agreements on certain District lands enabling the Commission to conduct hunting programs, manage wildlife resources, or establish those lands as Wildlife Management Areas (WMAs), Wildlife and Environmental Areas (WEAs) or Public Small Game Hunting Areas (PSGHAs); and

All existing agreements between the District and the Commission concerning the areas listed on the attached Exhibit "A" and mapped on the attached Exhibit "B", are hereby cancelled and replaced by this Agreement, leaving the Parties relationship concerning such areas controlled by only this Agreement. This Agreement shall not be deemed to affect the following agreements between the parties:

- A. FWC Contract No. 92061A - Lease agreement for District land on Andrews WMA
- B. FWC Contract No. 11012 - Management agreement for District land on Fort White WEA
- C. FWC Contract No. 10074 - Agreement for Access across Lafayette Forest WEA to Mallory Swamp WMA
- D. FWC Contract No. 98094 - Cooperative agreement enabling funding for:
 - ~~Potential future return of an inter-agency resource management employee position.~~
 - Existing District payments for enhanced FWC LE patrol

This Agreement and the above listed agreements are the only management agreements which presently exist between the parties.

The Parties wish to establish a comprehensive agreement regarding management of specified District lands for the protection of wildlife and the operation and regulation of compatible public uses related thereto in cooperation with the District. This comprehensive agreement shall be established in addition to the individual agreements listed above and all other WMA agreements between the Parties will be void upon execution of this Agreement.

Accordingly, the parties, in consideration of the premises above and the mutual benefits flowing from each to the other, agree as follows:

1. **PURPOSE.** The purpose of this Agreement is to provide for public outdoor recreational hunting and fishing opportunities on specified District lands. The Commission shall manage the lands to protect fish and wildlife, and shall administer programs for public recreational hunting and fishing consistent with this Agreement and Commission rules.
2. **TERM.** The initial term of this Agreement shall commence on the date the last of the Parties has signed this Agreement and continue for five years. Thereafter, this Agreement shall automatically renew for three additional five-year terms unless earlier terminated by either Party as provided for below. Extension of this Agreement beyond 20 years from the commencement date shall require both parties written agreement to do so.
3. **MANAGED AREAS.** The areas initially covered by this Agreement are listed in the attached Exhibit "A" and mapped in the attached Exhibit "B", incorporated herein by this reference. Lands may be added or removed from existing managed areas upon written request and approval by the Parties. New management areas or removal of a management area in its entirety shall be made by written amendment to this Agreement signed by both Parties. Exhibit "A" shall be amended to the list of the managed areas covered by this Agreement and Exhibit "B" shall be amended to include the map location of the area.
4. **COMMISSION RESPONSIBILITIES.** Consistent with the applicable District Land Management Plan, the Commission will, to the best of its ability and to the extent of its lawful authority, help manage and maintain the lands and any facilities supporting public recreational hunting and fishing use in an environmentally acceptable manner and in accordance with good management practices, which shall include, but not be limited to:
 - 4.1 Establishment of rules and regulations for the purposes of protecting and taking fish and wildlife;
 - 4.2 Enforcement of applicable laws and regulations, including periodic patrol and investigation, when necessary;
 - 4.3 Provision of personnel and signs for boundary posting;
 - 4.4 Repair of structures placed on the property by the Commission;
 - 4.5 Provision of public information on hunting and fishing and assistance to recreational hunters and anglers; and

- 4.6 The Commission shall meet annually with the District to develop a proposed work plan for each area listed in Exhibit "A".
5. **DISTRICT RESPONSIBILITIES.** The District is authorized and mandated, pursuant to chapter 373, Florida Statutes, and other legal authorities, to provide for overall management of the lands under this Agreement, including all management not provided by the Commission under this Agreement. Commission management of the lands under this Agreement shall not interfere with or be inconsistent with the District's overall management activities.
6. **ACCESS TO LANDS AND CLOSURE.** The Commission shall have full and free access to the lands under this Agreement for the purposes set forth herein. The District shall take all steps reasonably necessary to provide for such access. The District may close parts or all of the lands under this Agreement during drought, flood, fire, construction or land management activities, or other hazardous condition, and will provide reasonable notice of such closure to the Commission.
7. **ARCHAEOLOGICAL SITES.** Nothing contained herein affects any of the Parties' obligations pursuant to Chapter 267, Florida Statutes, regarding archaeological and historical sites. The collection of artifacts or the disturbance of archaeological and historical sites on state-owned lands is prohibited unless prior authorization has been obtained from the State of Florida Department of State, Division of Historical Resources.
8. **DISTRICT RESERVATIONS.** The District reserves and exempts from this Agreement:
- 8.1 All other existing uses of the property;
 - 8.2 All other recreational uses outside Commission-established hunting and fishing;
 - 8.3 All land management and maintenance activities exclusive of those related to Commission-established hunting and fishing;
 - 8.4 Management of wild hogs with approval from the Commission; and
 - 8.5 All water management uses. Water management uses take priority over all other uses, including Commission activities.
9. **PROJECT MANAGERS.** Bob Heeke, Sr. Land Resources Manager at 9225 County Road 49, Live Oak, FL 32060, telephone (386) 362-1001 is the District's Project Manager for this Cooperative Agreement. The Project Manager for the Commission is Mike Brooks, at FFWCC, 620 S. Meridian Street, Tallahassee, Florida 32399-1600, telephone (850) 488-3831. The Parties shall direct all matters arising in connection with the performance of this Agreement, other than notices, to the attention of the Project Managers for attempted resolution or action. The Project Managers shall be responsible for overall coordination and oversight relating to the performance of this Agreement.

10. **NOTICES.** All notices, demands, or other communications to the Commission under this Agreement shall be in writing and shall be deemed received if sent by certified mail to:

Rosa Torres
Florida Fish and Wildlife
Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600

All notices to the District under this Agreement shall be in writing and shall be deemed received if sent by certified mail to:

Bob Heeke
Land Management Program Manager
Suwannee River Water
Management District
9225 County Road 49
Live Oak, FL 32060

All notices required by this Agreement shall be considered delivered *upon receipt*. Should either Party change its address, written notice of such new address shall promptly be sent to the other Party.

11. **TERMINATION FOR CAUSE.** If either Party fails to fulfill its obligations under this Agreement in a timely and proper manner, the other Party shall have the right to terminate this Agreement by giving written notice of any deficiency. The Party in default shall then have 60 calendar days from receipt of notice to correct the deficiency. If the defaulting Party fails to correct the deficiency within this time, the noticing Party may terminate this Agreement at the expiration of the 60 day time period.

TERMINATION FOR CONVENIENCE. Either Party may terminate this Agreement, either in its entirety or as to a specific area, at any time for convenience upon 90 calendar days prior written notice to the other Party. Any such termination shall be effected by delivery to the other Party of a Notice of Termination specifying the extent to which performance of work under the Agreement is terminated, and the date upon which such termination becomes effective.

12. **AUTHORITIES.** It is understood and agreed that each party operates under its own legal authorities, policies and administration, and each party's obligations under this Agreement are thereby limited. It shall be the responsibility of each party to interpret its own authorities and policies, and make decisions as required under law and policies applicable to each. This Agreement is hereby entered into under the following authorities, and other applicable law:
- a. SRWMD, Chapter 373 FS as amended _____;
 - b. FWC: Article IV, Section 9, Florida Constitution.

c. FWC: Chapter 379, Florida Statutes

13. **NON-WAIVER OF REGULATORY AUTHORITY.** Nothing contained herein shall be construed as a waiver of or contract with respect to the regulatory or permitting authority of the District as it now or hereafter exists under applicable laws, rules and regulations.
14. **RECREATIONAL IMMUNITY.** The Parties agree that nothing contained herein shall be construed or interpreted as a waiver of limitations of liability provided in sections 375.251 and 373.1395, Florida Statutes.

ALLOCATION OF RISK. Each Party assumes any and all risks of personal injury, bodily injury and property damage attributable to the negligent acts or omissions of its officers, employees, servants, and agents thereof. The Commission, as a state agency, warrants and represents that it is self-funded for liability insurance with the State of Florida Risk Management System. The Commission shall provide to the District evidence of such insurance upon request. The Commission and the District further agree that nothing contained herein shall be construed or interpreted as (1) denying to either Party any remedy or defense available to such Party under the laws of the State of Florida; (2) the consent of the State of Florida or its agents and agencies to be sued; (3) the consent of the District to be sued; or (4) a waiver of sovereign immunity of either Party beyond the waiver provided in section 768.28, Florida Statutes. In the event the Commission subcontracts any part or all of the work hereunder to a third Party, the Commission shall require each and every subcontractor to identify the District as an additional insured on all insurance policies required by the Commission. Any contract awarded by the Commission shall include a provision whereby the Commission's subcontractor agrees to indemnify, pay on behalf, and hold the District harmless from all damages arising in connection with the Commission's subcontract.

15. **THIRD-PARTY BENEFICIARIES.** This Agreement has no third-party beneficiaries (intended or incidental), who may enforce obligations of either Party at any time, including after this Agreement expires or is terminated.
16. **DISPUTE RESOLUTION.** In the event a dispute arises that the project managers cannot resolve between themselves, the Parties shall have the option to submit to nonbinding mediation. The mediator or mediators shall be impartial, shall be selected by the Parties, and the cost of the mediation shall be borne equally by the Parties. The mediation process shall be confidential to the extent permitted by law.
17. **PUBLIC RECORDS.** The Parties shall allow public access to all project documents and materials in accordance with the provisions of Chapter 119, Florida Statutes. Should either Party assert an exemption to the requirements of Chapter 119 and related statutes, the burden of establishing such exemption, by way of injunctive or other relief as provided by law, shall be upon that Party.
18. **AUDIT.** The Commission shall maintain all financial and non-financial records and reports directly or indirectly related to the negotiation or performance of this Agreement, including

supporting documentation for any service rates, expenses, research or reports. Such records shall be maintained and made available for inspection for a period of five years from completing performance under this Agreement. The District or its designated agent shall have the right to examine in accordance with generally accepted governmental auditing standards all records directly or indirectly related to this Agreement. Such examination may be made only within five years from the date of completing performance under this Agreement and upon reasonable notice, time and place.

19. **WAIVER.** No waiver of any of the provisions of this Agreement shall be binding unless it is in writing and signed by both parties. The failure of either party to insist on the strict enforcement of any provision of this Agreement shall not constitute a waiver of any provision.
20. **CIVIL RIGHTS.** The Commission hereby assures that no person shall be excluded on the grounds of race, color, creed, national origin, handicap, age, or sex, from participation in, denied the benefits of, or be otherwise subjected to discrimination in any activity under this Agreement. The Commission shall take all measures necessary to effect these assurances.
21. **ASSIGNMENT.** The Commission shall not assign, delegate, or otherwise transfer its rights and obligations as set forth in this Agreement without the District's prior written consent. Any attempted assignment in violation of this provision shall be void.
22. **SEVERABILITY.** This Agreement has been delivered in the State of Florida and shall be construed in accordance with the laws of Florida. Wherever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement shall be prohibited or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement. Any action in connection herewith, in law or equity, shall be brought in Leon County, Florida, to the exclusion of all other lawful venues.
23. **WAIVER OF JURY TRIAL.** As part of the consideration for this Agreement, the Parties hereby waive trial by jury in any action or proceeding brought by any Party against any other Party pertaining to any matter whatsoever arising out of or in any way connected with this Agreement, or with the products or services provided under this Agreement; including but not limited to any claim of quantum meruit.
24. **ENTIRE AGREEMENT; AMENDMENT.** This Agreement with all incorporated attachments and exhibits represents the entire agreement of the parties. This Agreement may only be amended by mutual written agreement of the parties.

[signatures on following page]

The parties or their duly authorized representatives have signed this Agreement on the dates below each signature, the last date of which shall be inserted into the first paragraph.

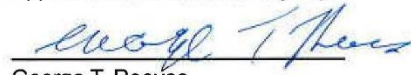
**SUWANNEE RIVER WATER
MANAGEMENT DISTRICT**



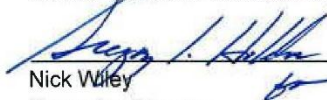
Ann B. Shortelle, PhD
Executive Director

Date: 10/18/2012

Approved as to form and legality:


George T. Reeves
Legal Counsel

**FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION**



Nick Wiley
Executive Director

Date: 11.21.12

Approved as to form and legality:


FWC Attorney

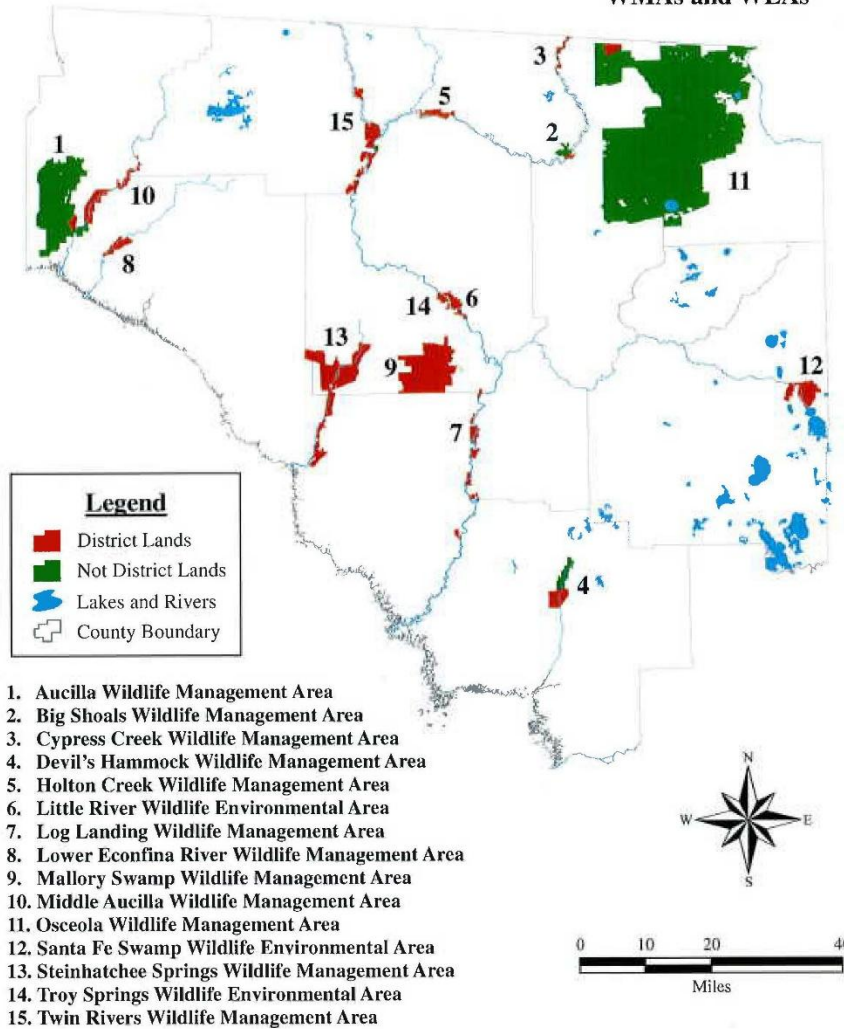
EXHIBIT "A"

District-managed lands to be established as Wildlife Management Areas or Wildlife and Environmental Areas

1. Aucilla Wildlife Management Area
2. Big Shoals Wildlife Management Area
3. Cypress Creek Wildlife Management Area
4. Devil's Hammock Wildlife Management Area
5. Holton Creek Wildlife Management Area
6. Little River Wildlife Management Area
7. Log Landing Wildlife Management Area
8. Lower Econfinia River Wildlife Management Area
9. Mallory Swamp Wildlife Management Area
10. Middle Aucilla Wildlife Management Area
11. Osceola Wildlife Management Area
12. Santa Fe Swamp Wildlife and Environmental Area
13. Steinhatchee Springs Wildlife Management Area
14. Troy Springs Wildlife Management Area
15. Twin Rivers Wildlife Management Area

EXHIBIT "B"

DISTRICT MANAGED
WMAs and WEAs



11.4 Public Input

11.4.1 Management Advisory Group Meeting Results

Aucilla Wildlife Management Area (AWMA) Management Advisory Group (MAG) Consensus Meeting Results

August 20, 2025 Monticello, 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 *August 20th, 2025*, at the Jefferson County R.J. Bailar Public Library, in Monticello, Florida in Jefferson County. The ideas found below were provided by stakeholders for consideration in the 2026 - 2036 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 with regard to 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:

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
1.	[14]	[35]	15. Restore and maintain natural communities. Restore and maintain natural communities to conditions that sustain ecological processes and promote biodiversity. Continue to employ a diversified prescribed fire program that includes more growing season fire. Continue to implement the forest resource management plan to benefit wildlife and native communities. Drive offsite pine plantations towards the desired future conditions of longleaf pine/ wiregrass complex. To manage for natural communities, vegetation management is essential to meet desired future conditions. Develop a comprehensive Timber Management Plan, and make it available for everyone. This plan should include specific objectives for timber management and timber production, including those for revenue generation, explaining how to get from A to B. There should be a spelled out, quantifiable process to see how successful the plan is. Everything being managed should be easily visible and measurable. Timber should be managed to benefit future generations and longer-lived species; if harvesting occurs, appropriate species should be replanted. In addition to timber management, FWC should expand on the fire management plan, and make sure that they are pushing not just the frequency of the burns, but also the quality. To achieve ecological benefits, well-timed and well-executed prescribed fire should be used in a safe way. Keep in mind that smoke is the most difficult safety-issue to contain.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
2.	[11]	[34]	34. High quality outdoor recreational opportunities. At the AWMA, hunting is the primary recreational user group. Continue to maintain Wacissa River access for boaters, anglers and hunters at Welaunee and Calico landings. We should continue to provide hunting and nature-based rec opportunities, and to maintain river access for boats and boat launches . Provide access to wildlife-centric, resource-based recreation. For any conservation efforts, it is important that it is palatable to the public. Expansion of recreational opportunities on public lands encourages public support of them. FWC should specifically identify recreational opportunities that don't interfere with resource management work that's happening. Consider developing campsites that include amenities, as this will promote public use and generate revenue for the County. It is not safe to have other recreational activities occurring on the AWMA during hunting seasons, and this should be kept in mind as new recreational facilities and opportunities are developed. To minimize conflict and prevent hindrance to each other, user groups should work together. Onsite signage, notices, and maps can and should be improved. FWC Law Enforcement has difficulty keeping ATVs off of the Water Management District lands within the AWMA. Improving maps and posting more signage will make use restrictions clearer to the public. Trail signage along the section of the Florida National Scenic Trail could include trail standards, acknowledgement of it being a federal trail, show the trails history, etc; this language should also be included in FWC Management Plans.
3.	[9]	[29]	26. Manage the land to maintain and protect healthy water resources. Wacissa and Aucilla river are OFWs. Manage bottomlands, uplands, and water resources in a manner that continues to protect aquatic resources of the area and of Apalachee Bay. Utilize BMP's to make sure we are not impacting water resources, including groundwater. Protect hydrological resources with road improvement and maintenance: Specifically use of rocks and low water crossings, culvert removes and replacement if necessary and where appropriate.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
4.	[6]	[13]	1. Manage fish and wildlife populations and habitats. Ensure their sustainability and that they function as part of larger regional populations. Restore, improve, and maintain natural habitat diversity with an emphasis on endangered and imperiled species habitat. Continue to survey and monitor wildlife and plant species with emphasis on endangered/imperiled and focal species.
5.	[6]	[20]	5. Expand conservation efforts through acquisition. The County is under tremendous pressure from growth, and it is currently in the process of trying to create a comprehensive plan and land development code to protect agriculture, conservation, and forestry. A lot of the citizens within this County depend on undeveloped land. Urban sprawl should be discouraged by expanding conservation efforts from local organizations and state agencies, because Counties are not able to currently do that. In the instance that the FWC or State cannot acquire the inholdings or have an easement within the inholdings, Tall Timbers and other conservation organizations can help with acquisitions. It should be encouraged to work with partners on filling 'holes' within any WMA. Some people may not want to sell to the State, and other conservation organizations have a variety of funding pulls that can be utilized for landowners that may be apprehensive.
6.	[6]	[23]	36. Proactive and preventative invasive plant management. Early detection and preventative measures can help minimize adverse impacts of invasives. Continue to identify invasive species and the locations of them, then use aggressive control measures to prevent spread. Proactively provide wash stations for recreational users to prevent spread. Inventory of invasives should be kept and monitored, including both plants and feral hogs. Consider hiring contractors for feral hog management; trapping with a contractor is the most effective means for feral hogs, they are dangerous and extremely harmful to ecosystems.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
Two items of equal rank:			
7.	[5]	[19]	39. Work with partners and stakeholders to achieve resource management objectives. Research and special-use-permits for researchers should be supported. Continue to work with agencies, local organizations, and academic researchers to expand knowledge of listed species and various management activities. Interagency coordination and cooperative agreements should be maintained and include mutually supportive goals and initiatives. Fire lines on shared boundaries should be maintained.
7.	[5]	[19]	44. Protect and preserve the cultural resources. The AWMA is one of the richest areas in all of the southeast with cultural resources. Continue to work with FWC Law Enforcement, researchers, and the Department of Historical Resources (DHR) to make sure cultural resources are in the Master Site File. All FWC Staff need to be up to speed on ARM training, because it helps to raise awareness for FWC Staff and Law Enforcement on how to monitor sites, what to look for, how to manage them, and how to report them. Consult with DHR and keep a better list of the sites. Current maps of cultural resource sites are not accurate; use of LiDAR and DHR can help assist relocating the mapped points to accurately portray where the sites are on the AWMA. Coordinate with FWC Law Enforcement to help prevent damage to archeological sites. DHR can help with interpretive signage for cultural resources where they would be feasible. Signs could include broad language to give historical background of the different cultural resource sites.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
8.	[3]	[6]	35. Have a trails master plan. A Trails Master Plan begins with a professional trail builder and input from all user groups; a trail builder would look at soil content and natural resources, then design sustainable trails that all user groups can enjoy. It may take a partnership with user groups or organizations for fundraising, and having a Trails Master Plan gives them what the AWMA’s vision is for recreational users. There should be a focus on trail connectivity to other trails and places outside of the AWMA, as this can bring local revenue. Increasing both mixed and single use trails can help decrease conflicts for user groups, and increase recreational group(s) usage. Having trails specifically for certain user groups (e.g., horseback riding or mountain biking) is preferable. Trailhead infrastructure suitable for multiple user groups is important; stakeholders recommend restrooms, changing groups, bike repair and wash stands, showers, parking, maps, kiosks, and “you are here” map signage. Trails should also have evenly spaced markers. Bridge structures found on the portions of the Florida National Scenic Trail found on the AWMA should continue to be maintained and improved; keep these and other structures in mind when doing prescribed burns.
9.	[3]	[7]	8. Restore native vegetation. Improve prescribed fire frequency and seasonality, as well as invasive plant management. Certain areas on the AWMA are more ecologically sensitive than others; these areas should be protected and recreational uses should be kept at a distance to mitigate their effects on the landscape. For example, don’t have horse trails or multi-use trails nearby because they can easily introduce invasive species.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
10.	[1]	[1]	6. Establish designated equestrian trails. Equestrians are not opposed to multi-use trails, but they can bring issues because horses get spooked easily. Having equestrian designated trails, or portions of trails that are equestrian specific, would prevent this. Trails could also include yield direction signs, safe access to water for horses, and adequate parking for horse trailers. Rocks and geo-webbing for low water crossings are not compatible with horses and aren't the best solution for trail crossings. Rocks and geo-webbing arent always the solution for trail crossings;
11.	[1]	[2]	21. Track, manage, and protect rare and listed plant species. Including FNAI plant surveys, land managers should know where these plants are and tracking those areas to preserve them.

Aucilla Wildlife Management Area

MAG Meeting Participants

<u>Name</u>	<u>Affiliation</u>
Active Participants	
Morgan Wilbur	FWC Area Biologist
Greg Louque	FWC Law Enforcement
Scott Gregor	Suwannee River Water Management District
Nelson Ball	Tall Timbers
David Wheeler	Jefferson County Planning Department
Jimmy McQuigg	Florida Forest Service
Daryl Hatfield	Florida Department of Environmental Protection
Adam Fryska	Florida Trail Association
Lilly Anderson-Messec	Florida Native Plant Society
Nicholas Yarbrough	Division of Historical Resources (DHR)
Richard Shoop	Tallahassee Mountain Bike Association
Rusty McKeithen	Florida Dog Hunters Association
Joyce Papp	Southern Trailriders Association
Erin Albury	Four Rivers Land and Timber Co.
Supportive Participants	
Clint Peters	FWC Habitat and Species Conservation (HSC), Regional Biologist
Colleen Closius	FWC HSC, Assistant Regional Biologist
Justin VanGorder	FWC HSC, District Biologist
Brianna Bjordhal	FWC HSC, Conservation Biologist
Katherine Burke	FWC Public Access Services Office (PASO), Section Leader
Tom M. Matthews	FWC PASO, Public Access Planner
Ben Rangel	FWC PASO, Outreach/Interpretive Representative

Corwynne Pugh	FWC PASO, Public Access Biologist
Scout Baines	FWC PASO, Public Access Technician
Adam Lache	FWC Regional Volunteer Coordinator
Joe Davis	FWC HSC, Biologist
Mollie Baldwin	FWC HSC, Biologist
Brandon Ackerman	DHR

Invited but Unable to Attend

Ben White	Jefferson County Commissioner, District 5
Pam Feagle	Taylor County Commissioner, District 4
Jade Greene	Florida Geological Survey
Frank Price	Florida Natural Areas Inventory (FNAI)
Kim Alexander	FNAI
Tommy Thompson	Apalachee Canoe & Kayak Club
Thomas Michael	Tallahassee Bass Anglers
Naila McCraney	Natural Resources Conservation Services

FWC Planning Personnel

Savannah Atwell	Land Conservation Planner, Facilitator
Cedar Spirk	Land Conservation Planner, Recorder
Christina Omran	Senior Land Conservation Planner, Recorder

11.4.2 Public Hearing Report

**PUBLIC HEARING REPORT
FOR
AUCILLA WILDLIFE MANAGEMENT AREA
MANAGEMENT PLAN
HELD BY THE
AUCILLA WILDLIFE MANAGEMENT AREA MANAGEMENT ADVISORY GROUP
AND THE
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION**

DECEMBER 2ND, 2025 – JEFFERSON COUNTY

The following report documents the public input that was received at the Aucilla Wildlife Management Area (AWMA) Management Advisory Group's (MAG) public hearing for the update to the Management Plan for AWMA that was held at 6:00-8:00 PM, on December 2nd at the Jefferson County Courthouse Annex in Monticello, Florida.

AWMA Management Advisory Group Introduction:

The meeting was introduced by Mr. David Wheeler, an AWMA Management Advisory Group participant, who represented the AWMA MAG. Mr. Wheeler indicated that he was one of 12 stakeholders that attended the Florida Fish and Wildlife Conservation Commission (FWC) facilitated AWMA MAG meeting held on Tuesday December 2nd, 2025. Mr. Wheeler 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 AWMA MAG meeting report were available at the front door for the public's review. Mr. Wheeler thanked everyone for attending and then introduced Ms. Savannah Atwell, Land Conservation Planner, FWC, to facilitate and coordinate the presentation of an overview of AWMA, FWC's planning process, and the draft components of the AWMA Draft Management Plan.

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

FWC member Ms. Atwell welcomed everyone and thanked the public for their attendance. Ms. Atwell 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 AWMA, and not hunting and fishing regulations, indicating there is a separate public input process for FWC rule and regulation development. Ms. Atwell then described the materials that were available at the door for public review, including the AWMA Management Prospectus and the MAG Meeting Report. Ms. Atwell then presented the agenda for the public hearing and facilitated the introduction of all FWC staff in attendance to the audience. Ms. Atwell then presented an overview and orientation of AWMA, including a description of the natural communities, data about AWMA 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. She 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 AWMA Overview and FWC's Planning Process:

Ms. Atwell 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. Ms. Atwell again emphasized that the exclusive purpose for the public hearing was to collect public input regarding the elements of the Draft Management Plan for AWMA, 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 AWMA public hearing meeting.

Presentation of the AWMA Draft Management Plan:

At this point, Mr. Morgan Wilbur began the presentation of the AWMA Draft Management Plan. Mr. Wilbur then completed and concluded the presentation of the AWMA Draft Management Plan.

Questions and Comments on the AWMA Draft Management Plan Presentation:

Ms. Atwell 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. She informed them that all comments, questions, and public testimony will be duly considered equally by FWC.

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

I have a question about the feral hog population. What is the population? How many have been removed on an annual basis and what is the long-term strategy?

FWC Response: Mr. Morgan Wilbur, AWMA Lead Area Biologist, responded:

Well, we don't know what the population is or how many are being extracted. Our long-term goal right now is to maximize the hunting opportunities for them. Aucilla is a big area. We have looked into sounder removal. Places where it has been tried, smaller areas, have been somewhat ineffective.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

Excuse me, what did you call that? What kind of removal?

FWC Response: Mr. Morgan Wilbur, AWMA Lead Area Biologist, responded:

Sounder removal. Sounder is a group of hogs. And the most effective way of eliminating hogs from an area is to remove the entire sounder. It is usually done with traps that are monitored with cameras. You monitor and determine how many hogs are in the sounder and then monitor to

make sure they're all in the trap before you set it and capture them all. If you miss one or two, they become educated and may become trap-shy after that.

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

How will the proposed trapping regulation changes affect removal of the sounders? It's my understanding that the pig brigs and those large traps wouldn't technically meet qualifications.

FWC Response: Mr. Clint Peters, WHM Regional Biologist, responded:

She's referring to the State-wide trapping regulations that are changing private and public land. That really has nothing to do with this management plan.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

So that would still be a tool that you would be able to use?

FWC Response: Mr. Clint Peters, WHM Regional Biologist, responded:

If one day we get to that point, yes. But it's currently not something that we are proposing.

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

I had a question about the herbicidal and vegetation management with regards to the water. What is the monitoring of the water quality both on the surface and sub-surface? And how do any of these proposed changes...I guess one of the reasons why the land was acquired was to maintain the water quality. So, what is being done?

FWC Response: Mr. Morgan Wilbur, AWMA Lead Area Biologist, responded:

Yes, we are using aquatic approved herbicides even in our upland areas and the water management district and DEP have water monitoring sites on the river. So, there is a lot of water monitoring that goes on. We're not doing it ourselves, but we cooperate with the water management district and entities that do that and the data is available to us.

Public Response: The same unidentified member of the audience continued this line of comments and questions:

Is the water quality good?

FWC Response: Mr. Morgan Wilbur, AWMA Lead Area Biologist, responded:

Yeah, it's good. I don't have at my fingertips the increase or decrease of water quality, but I think especially the Wacissa River, the major impacts are probably from agriculture up on the hill. But

the water quality on the river is generally good. It doesn't suffer from some of the Nitrate impacts that others do.

FWC Response: Mr. Clint Peters, WHM Regional Biologist, responded:

And any spraying that we're doing, we're using aquatic approved herbicides but we're not spraying in any aquatic environments. We're spraying in the uplands. It's just to manage some of the invasive exotic vegetation for the most part. Some native invasives as well.

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

I noticed the mention of a Landowners Assistance Program workshop that would be done. I'm unfamiliar with what the program is. Is that something I could get clarification on?

FWC Response: Mr. Morgan Wilbur, AWMA Lead Area Biologist, responded:

It's a program to incentivize landowners to manage for wildlife and maintain good habitat. I think there are grant programs associated with it that can fund management activities on private lands.

FWC Response: Mr. Clint Peters, WHM Regional Biologist, responded:

And we can get you more information and a contact person for this area.

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

Expansion by the lifetime program that you guys were talking about. I noticed some pockets on the map. Are there any other propositions to acquire more land?

FWC Response: Ms. Savannah Atwell, Land Conservation Planner, responded:

The Florida Forever Projects have been identified as ecologically valuable and deserving of being put into conservation. So, there is a program where funds are available if there is a willing landowner, it can be purchased and become conservation land.

FWC Response: Mr. Morgan Wilbur, AWMA Lead Area Biologist, responded:

And there are additional lands that we have identified to be part of our future optimal boundary if they became available and they would then be added to that Florida Forever list.

FWC Response: Ms. Rachel Penrod, Public Access Services Office Director, responded:

And the Florida Forever priority acquisitions are publicly available. That's posted by the Division of State Lands within DEP so you would have to reach out to them. But they have the priority lands acquisition list and also have the wildlife corridor.

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

Public Testimony on the AWMA Draft Management Plan:

Three members of the public audience submitted speaker cards indicating their intention to provide formal public testimony. Ms. Atwell again emphasized that the public hearing was for taking input regarding the AWMA Draft Management Plan and called the first speaker to the podium.

Public Testimony 1: Nancy Stephens provided the following public testimony:

Thank you for giving us this opportunity to speak tonight. My name is Nancy Stephens, I'm president of the North Florida Back Country Horsemen and we work with public land managers, State and Federal agencies, local and regional across north Florida. The first thing that I already touched on was the feral hog issue. I know that you know that so many things that you talked about wanting to do on this property are thwarted by the hogs. Whether it's planting new native species or fire control, it all is. And I know that this agency alone can't stop the explosion of feral hogs in the State of Florida but I think it's important to be on the record that we care a lot about the proliferation of feral hogs in the State of Florida on this property and hope that our voices are heard at some point and we get this under control in Florida. We've seen what it's done in other states like Texas and it's just out of control. Relative to horseback riding- there was a statement in the plan and also that you showed on the screen about maintaining public access "including" and horseback riding was not in that sentence, and we always like to see horseback riding. We do recognize in the plan the historic use of horseback riding and I myself have been riding there for decades and I know a lot of people in the area have ridden those lands for many decades. We appreciate the fact that you recognize that we want to maintain the ability to do that going forward. We understand that there are no equestrian trails there now but there may come a time when it may become appropriate for equestrian trails to become established, so we want to keep that door open. We also understand from a reference in the plan that horseback riding is allowed on the roads. Some of the roads are dirt, which is great for horseback riding, some of them are lime rock. The lime rock is not horse friendly. It actually causes abscesses on horses' hooves- it's a health problem for horses. So, we would like y'all to keep an open mind about us riding beside the roads maybe on firebreaks, closed roads, and definitely beside the lime rock roads. The last thing I would like to mention is parking. It would be great for us to have a pervious surface parking lot large enough for at least three or four horse trailers of four horse size adjacent to State Road 59. If we could do that then we could park there and get out and ride. Currently we don't really know where we're supposed to park. And lastly because Plank Road State Forest is right across the road and we're working with the forest managers there on trails, we would like you to think about connectivity between the forest and Aucilla Wildlife Management Area and where you would like us to do that. Those are my comments, thank you very much for the opportunity.

Public Testimony 2: Joanne Brown provided the following public testimony:

My name is Joanne Brown, and I am a resident of Jefferson County. I'm also with the North Florida Back Country Horsemen, I'm a director. I'm also a horse owner and an equestrian. In addition to

Florida Fish and Wildlife Conservation Commission | AWMA Management Plan

the Aucilla WMA, there are six additional public tracts within Jefferson County. However, none of them established equestrian trails and also some have no parking for horse trailers, they're swampy or just not conducive to making trails. So, kind of piggy backing on what Nancy was saying, concentrating our efforts on this particular track would make the most sense for a user-friendly equestrian trail.

Public Testimony 3: Cindi Bell provided the following public testimony:

There are huge economic benefits to encouraging horseback riding. People come from all over the State to ride here. These people have big rigs. They buy diesel, they buy food and if camping could ever be provided that would be a big economic boom too. It is a big draw for the horseback riding public to come to this area. Build it and they will come.

Adjournment:

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

No other speakers offered further comments.

Then Ms. Atwell declared the public hearing adjourned.

11.5 Public Hearing Notice, Advertisements, and Press Release

11.5.1 Public Hearing Notice

NOTICE

Florida Fish and Wildlife Conservation Commission
Announces a

PUBLIC HEARING

for the

Aucilla

Wildlife Management Area Management Plan

Jefferson County, Florida

6:00 P.M. Tuesday, December 2nd, 2025

Jefferson County Courthouse Annex
435 Walnut St.
Monticello, FL 32344

PURPOSE: To receive public comment regarding considerations for the FWC ten-year Land Management Plan for the Aucilla Wildlife Management Area (AWMA). This hearing is being held EXCLUSIVELY for discussion of the Aucilla WMA 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 Savannah Atwell via telephone at (850) 487-9588, via email at Savannah.Atwell@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.

11.5.2 Regional FWC Press Release



Florida Fish and Wildlife
Conservation Commission

Help plan the future of Aucilla WMA

Florida Fish & Wildlife Conservation Commission sent this bulletin at 10/31/2025 08:43 AM EDT

For immediate release: Oct. 31, 2025

Contact: Ryan Sheets, Ryan.Sheets@MyFWC.com

Photos available [1](#) | [2](#)

Suggested post: Join @MyFWC staff on Dec. 2 in Monticello to make your voice heard on the management of the Aucilla WMA:

[#Florida](https://content.govdelivery.com/accounts/FLFFWCC/bulletins/3f961a5)



Help plan the future of Aucilla WMA

The Florida Fish and Wildlife Conservation Commission (FWC) will present the draft materials for the Aucilla Wildlife Management Area 10-year Land Management Plan at a public hearing in Jefferson County on Tuesday, Dec. 2.

The public hearing will be held at 6 p.m. at the Jefferson County Courthouse Annex, 435 Walnut St., in Monticello. The public is encouraged to attend and will have the opportunity to comment and ask questions regarding the Land Management Plan for the FWC-managed WMA.

The Aucilla WMA encompasses approximately 44,457 acres in Jefferson County and is an important piece of the conservation lands that span from the St. Marks River to the Suwannee River along Florida's Nature Coast. Dozens of pristine freshwater creeks and springs wind through the Aucilla WMA, showcasing the unique geological features of the area. The Aucilla WMA also offers many opportunities for public recreation, including hunting, fishing, wildlife watching, and other fish and wildlife-focused public recreation.

"The Aucilla WMA was purchased to protect the watershed and water quality of the Wacissa and Aucilla rivers, as well as the estuarine systems at the mouth of the Aucilla River that flows into nearby Apalachee Bay and the Big Bend Seagrasses Aquatic Preserve, and to provide fish and wildlife-focused outdoor recreation opportunities to the public," said **Savannah Atwell, FWC Land Conservation Planner**. "This Management Plan will specify how we intend to accomplish that goal."

For more information regarding this and other [upcoming public hearings](#), visit [MyFWC.com/Conservation](#), then click "Terrestrial Conservation" and "Management." Hunting and fishing regulations are not 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.

To obtain a copy of the draft elements of the Management Plan for the Aucilla WMA, visit the [Land Management Plans in Development](#) page or contact Savannah Atwell at 850-487-9588 or Savannah.Atwell@MyFWC.com.

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. To see more about [Land Management Plans](#), visit [MyFWC.com/Conservation](#), click "Terrestrial Conservation," then scroll to "Management Plans (WMA)."

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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



11.5.3 Newspaper Advertisement

[SEARCH](#) | [SUBSCRIPTION](#) | [ARCHIVES](#)

THE OUTDOOR WIRE
The Outdoor Industry's Daily Transactions Newsletter

SUNDAY, NOVEMBER 2, 2025 | **STATE AGENCIES**

Help Plan the Future of Aucilla WMA

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The public hearing will be held at 6 p.m. at the Jefferson County Courthouse Annex, 435 Walnut St., in Monticello. The public is encouraged to attend and will have the opportunity to comment and ask questions regarding the Land Management Plan for the FWC-managed WMA.

The Aucilla WMA encompasses approximately 44,457 acres in Jefferson County and is an important piece of the conservation lands that span from the St. Marks River to the Suwannee River along Florida's Nature Coast. Dozens of pristine freshwater creeks and springs wind through the Aucilla WMA, showcasing the unique geological features of the area. The Aucilla WMA also offers many opportunities for public recreation, including hunting, fishing, wildlife watching, and other fish and wildlife-focused public recreation.

"The Aucilla WMA was purchased to protect the watershed and water quality of the Wacissa and Aucilla rivers, as well as the estuarine systems at the mouth of the Aucilla River that flows into nearby Apalachee Bay and the Big Bend Seagrasses Aquatic Preserve, and to provide fish and wildlife-focused outdoor recreation opportunities to the public," said Savannah Atwell, FWC Land Conservation Planner. "This Management Plan will specify how we intend to accomplish that goal."

For more information regarding this and other upcoming public hearings, visit [MyFWC.com/Conservation](#), then click "Terrestrial Conservation" and "Management." Hunting and fishing regulations are not 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.

To obtain a copy of the draft elements of the Management Plan for the Aucilla WMA, visit the [Land Management Plans in Development](#) page or contact Savannah Atwell at 850-487-9588 or Savannah.Atwell@MyFWC.com.

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. To see more about [Land Management Plans](#), visit [MyFWC.com/Conservation](#), click "Terrestrial Conservation," then scroll to "Management Plans (WMA)."

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 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



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11.6 Soil Series Descriptions

11.6.1 Jefferson County Soil Descriptions

Map Unit Description

Jefferson County, Florida

[Minor map unit components are excluded from this report]

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

Component: Ortega (85%)

The Ortega component makes up 85 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 eolian or 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 restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 51 inches during January, February, March, April, May, June. Organic matter content in the surface horizon is about 2 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: 3 - Chipley fine sand, 0 to 5 percent slopes

Component: Chipley (85%)

The Chipley component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on flats 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 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: 4 - Surrency fine sand

Component: Surrency (85%)

The Surrency component makes up 85 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 moderate. Shrink-swell potential is low. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6w. 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: 8 - Chaires-Chaires, wet, fine sands, 0 to 2 percent slopes

Component: Chaires (62%)

The Chaires component makes up 62 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, 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 low. 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, May, June, July, August, September, December. Organic matter content in the surface horizon is about 4 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: Chaires, wet (30%)

The Chaires, wet component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats, 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 low. 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 4 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface.



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Map Unit Description

Jefferson County, Florida

Map unit: 8 - Chaires-Chaires, wet, fine sands, 0 to 2 percent slopes

Component: Chaires, wet (30%)

the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 9 - Leon fine sand

Component: Leon, non-hydric (55%)

The Leon, non-hydric component makes up 55 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 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 5 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: Leon, hydric (30%)

The Leon, 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 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 4 inches during January, February, March, April, November, December. Organic matter content in the surface horizon is about 5 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: 20 - Albany sand, 0 to 2 percent slopes

Component: Albany (80%)

The Albany component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on interfluvial 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 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, 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: 22 - Plummer fine sand

Component: Plummer, hydric (65%)

The Plummer, hydric component makes up 65 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 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, May, June, July, December. Organic matter content in the surface horizon is about 5 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.

Component: Plummer, non-hydric (20%)

The Plummer, non-hydric component makes up 20 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 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 5 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria.



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Map Unit Description

Jefferson County, Florida

Map unit: 22 - Plummer fine sand

Component: Plummer, non-hydric (20%)

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: 23 - Pelham fine sand

Component: Pelham, non-hydric (50%)

The Pelham, non-hydric component makes up 50 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 occasionally 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 3 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 (35%)

The Pelham, hydric component makes up 35 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 occasionally 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 3 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: 25 - Pits

Component: Pits (100%)

Generated brief soil descriptions are created for major soil components. The Pits is a miscellaneous area.

Map unit: 30 - Pamlico-Dorovan mucks

Component: Pamlico (45%)

The Pamlico component makes up 45 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains 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 frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. 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.

Component: Dorovan (30%)

The Dorovan component makes up 30 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 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 very high. Shrink-swell potential is low. This soil is frequently flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, December. 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.



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Map Unit Description

Jefferson County, Florida

Map unit: 35 - Rutlege fine sand

Component: Rutlege (85%)

The Rutlege component makes up 85 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 marine deposits and/or fluvio-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 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 January, February, March, April, May, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 6w. 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: 47 - Nutall-Toolles complex

Component: Nutall (45%)

The Nutall component makes up 45 percent of the map unit. Slopes are 0 to 1 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, bedrock, lithic, is 21 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 7 inches during March, July, August. Organic matter content in the surface horizon is about 4 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.

Component: Toolles, non-hydric (20%)

The Toolles, non-hydric component makes up 20 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. 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 9 inches during February, March, April, May, June, July, August, September. 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.

Component: Toolles, hydric (20%)

The Toolles, hydric component makes up 20 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. 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 4 inches during February, March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3w. 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: 54 - Leon-Chaires fine sands

Component: Leon, non-hydric (26%)

The Leon, non-hydric component makes up 26 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 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 very 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 March, April, June, July, August, September. Organic matter content in the surface horizon is about 5 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.



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Map Unit Description

Jefferson County, Florida

Map unit: 54 - Leon-Chaires fine sands

Component: Chaires, non-hydric (24%)

The Chaires, non-hydric component makes up 24 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 12 inches during March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 1 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: Chaires, hydric (15%)

The Chaires, 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 4 inches during March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 1 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.

Component: Leon, hydric (15%)

The Leon, 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 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 very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 4 inches during March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 5 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: 58 - Chiefland-Chiefland, frequently flooded fine sands

Component: Chiefland (50%)

The Chiefland component makes up 50 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 30 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very 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 March. 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.

Component: Chiefland, freq flooded (30%)

The Chiefland, freq flooded component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 30 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during April. Organic matter content in the surface horizon is about 1 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 Description

Jefferson County, Florida

Map unit: 61 - Tooles-Tooles, depressional-Chaires, depressional, fine sands

Component: Tooles, depressional (26%)

The Tooles, depressional component makes up 26 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. 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 February, March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 4 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.

Component: Tooles, non-hydric (25%)

The Tooles, non-hydric component makes up 25 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. 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 9 inches during February, March, April, May, June, July, August, September. 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.

Component: Chaires, depressional (24%)

The Chaires, depressional component makes up 24 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 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 February, March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 1 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.

Component: Tooles, hydric (10%)

The Tooles, hydric component makes up 10 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. 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 4 inches during February, March, April, May, June, July, August, September. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 3w. 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: 62 - Nutall-Tooles fine sands, frequently flooded

Component: Nutall, frequently flooded (41%)

The Nutall, frequently flooded component makes up 41 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 21 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, November, December. Organic matter content in the surface horizon is about 4 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 Description

Jefferson County, Florida

Map unit: 62 - Nutall-Toolles fine sands, frequently flooded

Component: Toolles, frequently flooded (39%)

The Toolles, frequently flooded component makes up 39 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May. Organic matter content in the surface horizon is about 4 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: 99 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

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.

11.6.2 Taylor County Soil Descriptions

Map Unit Description

Taylor County, Florida

[Minor map unit components are excluded from this report]

Map unit: 8 - Meadowbrook fine sand, 0 to 2 percent slopes

Component: Meadowbrook (80%)

The Meadowbrook component makes up 80 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 9 inches during January, February, March, August, September, October, 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.

Map unit: 13 - Hurricane fine sand, 0 to 3 percent slopes

Component: Hurricane (77%)

The Hurricane component makes up 77 percent of the map unit. Slopes are 0 to 3 percent. This component is on rises on marine terraces on coastal plains, knolls 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 very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 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 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: 23 - Melvina-Moriah-Lutterloh complex

Component: Melvina (44%)

The Melvina component makes up 44 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. 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 low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 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 4s. 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: Moriah (18%)

The Moriah component makes up 18 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 72 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 low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 inches during January, February, March, April, May, June, July, August, September, December. 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.

Component: Lutterloh, limestone substratum (16%)

The Lutterloh, limestone substratum component makes up 16 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, bedrock, paralithic, is 60 to 80 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 low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 23 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



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Map Unit Description

Taylor County, Florida

Map unit: 23 - Melvina-Moriah-Lutterloh complex

Component: Lutterloh, limestone substratum (16%)

a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map unit: 49 - Seaboard-Bushnell-Matmon complex, 0 to 3 percent slopes

Component: Seaboard (28%)

The Seaboard component makes up 28 percent of the map unit. Slopes are 0 to 3 percent. This component is on rises on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer, bedrock, paralithic, is 6 to 20 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 restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 1 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.

Component: Bushnell (25%)

The Bushnell component makes up 25 percent of the map unit. Slopes are 0 to 3 percent. This component is on rises on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy and clayey marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 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 low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 3 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.

Component: Matmon (23%)

The Matmon component makes up 23 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on marine terraces on coastal plains, knolls on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 10 to 20 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 very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4s. 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: 51 - Toolles-Nutall complex, frequently flooded

Component: Toolles, frequently flooded (60%)

The Toolles, frequently flooded component makes up 60 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 5 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 3 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: Nutall, frequently flooded (30%)

The Nutall, frequently flooded component makes up 30 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, May, June.



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Map Unit Description

Taylor County, Florida

Map unit: 51 - Tooles-Nuttall complex, frequently flooded

Component: Nuttall, frequently flooded (30%)

July, August, September, December. 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.

Map unit: 68 - Matmon-Wekiva-Rock outcrop complex, occasionally flooded

Component: Matmon (40%)

The Matmon component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 10 to 20 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 very low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 4s. 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: Wekiva (35%)

The Wekiva component makes up 35 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 10 to 30 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 very low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 9 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 5 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: Rock outcrop (14%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Map unit: 69 - Eunola, Goldhead, and Tooles fine sands, commonly flooded

Component: Eunola (49%)

The Eunola component makes up 49 percent of the map unit. Slopes are 0 to 2 percent. This component is on stream terraces on marine terraces on coastal plains. The parent material consists of loamy fluviomarine 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 24 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 1 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.

Component: Goldhead (20%)

The Goldhead component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains 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 frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3w. 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.



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Map Unit Description

Taylor County, Florida

Map unit: 69 - Eunola, Goldhead, and Tooloes fine sands, commonly flooded

Component: Tooloes (11%)

The Tooloes component makes up 11 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 4 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 3 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: 70 - Chiefland-Chiefland, frequently flooded, complex

Component: Chiefland (40%)

The Chiefland component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on rises on flood plains on karstic marine terraces, rises on flood plains on coastal plains, rises on flood plains on marine terraces on karstic marine terraces, rises on flood plains on marine terraces on coastal plains, knolls on flood plains on karstic marine terraces, knolls on flood plains on coastal plains, knolls on flood plains on marine terraces on karstic marine terraces, knolls on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 24 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very 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 January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 3 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.

Component: Chiefland, frequently flooded (35%)

The Chiefland, frequently flooded component makes up 35 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on flood plains on marine terraces on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, paralithic, is 24 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during January, February, March, April, May, June, July, August, September, December. Organic matter content in the surface horizon is about 3 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.

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11.7 FNAI Natural Communities and Altered Landcover Types Descriptions

Natural Community Descriptions

Basin Swamp (7,462.35 acres, 16.45%)

Basin swamps are forested wetlands of primarily deciduous trees occurring in large, irregularly-shaped, sometimes linear, depressions. At the Aucilla Wildlife Management Area (AWMA), the closed canopy is characterized by pond cypress (*Taxodium ascendens*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*), with lesser amounts of sweetbay (*Magnolia virginiana*), red maple (*Acer rubrum*), slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*), and green ash (*Fraxinus pennsylvanica*). The subcanopy is sparse, with dahoon holly (*Ilex cassine* var. *cassine*), swamp bay (*Persea palustris*), Carolina ash (*Fraxinus caroliniana*), and wax myrtle (*Morella cerifera*) commonly found, along with saplings of the canopy species. Tall shrub cover may be dense, especially on the edges of the swamps, and is primarily represented by titi (*Cyrilla racemiflora*), common buttonbush (*Cephalanthus occidentalis*), wax myrtle, and fetterbush (*Lyonia lucida*), with lesser amounts of coastal doghobble (*Leucothoe axillaris*), Virginia willow (*Itea virginica*), and myrtle-leaved holly (*Ilex cassine* var. *myrtifolia*). Short shrubs are usually sparse with fetterbush and coastal sweet pepperbush (*Clethra alnifolia*) being the most common. The herb layer is usually sparse, as the ground is mostly bare muck when exposed at low water; common herbaceous species encountered are Jamaica swamp sawgrass (*Cladium jamaicense*), dotted smartweed (*Persicaria punctata*), millet beaksedge (*Rhynchospora miliacea*), and lizard's tail (*Saururus cernuus*).

Many of the basin swamps on the AWMA were logged between 1999 and 2004; these areas typically have a dense cover of weedy herbaceous species including shortbristle horned beaksedge (*Rhynchospora corniculata*), Walter's sedge (*Carex striata*), shrubby primrosewillow (*Ludwigia suffruticosa*), and hairy primrosewillow (*Ludwigia pilosa*), plus species more typical of depression marshes such as peelbark St. John's wort (*Hypericum fasciculatum*) and fringed yellow-eyed grass (*Xyris fimbriata*). These open areas are often dotted with islands of canopy trees or dense titi shrubs laced together with laurel greenbrier (*Smilax laurifolia*). Epiphytes are often present but not as a major community component. Epiphytes include green-fly orchid (*Epidendrum conopseum*), resurrection fern (*Pleopeltis michauxiana*), and Bartram's air-plant (*Tillandsia bartramii*). The vegetation of basin swamps with limestone near the surface may resemble that of floodplain swamps.

Baygall (3,059.38 acres, 6.74%)

Baygalls are forested wetlands dominated by evergreen shrubs or bay trees often occurring at the bottom of a slope or in a depression fed by seepage. At the AWMA, baygalls are tall, dense shrub communities dominated by titi and black titi (*Cliftonia monophylla*), often with lesser amounts of large gallberry (*Ilex coriacea*), fetterbush, and wax myrtle. Scattered trees of a variety of species may be present but do not form a closed canopy; these include pond cypress, swamp tupelo, pond pine (*Pinus serotina*), slash pine, loblolly pine, loblolly bay (*Gordonia lasianthus*), and sweetbay. Vines of laurel greenbrier may knit together the shrubs to form an impenetrable

tangle. Herbs are found only in openings, the most common being Carolina redroot (*Lachnanthes caroliniana*) and Virginia chain fern (*Woodwardia virginica*).

Depression Marsh (39.28 acres, 0.09%)

Depression marsh is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation or subshrubs, often in concentric bands. Depression marshes typically occur in landscapes occupied by fire-maintained matrix communities such as mesic flatwoods, dry prairie, or sandhill. The concentric zones or bands of vegetation are related to length of the hydroperiod and depth of flooding. Depression marshes at the AWMA are seen on the 1949 aerials fringing forested wetlands (dome swamps, basin swamps, and to some extent hydric hammock) and, toward the southern end of the AWMA, as isolated ponds in a flatwoods matrix. Most of the depression marshes have been altered by fire-exclusion, pine plantation, and road building along the edges of the wetlands. Species commonly present include Walter's sedge, Jamaica swamp sawgrass, tenangle pipewort (*Eriocaulon decangulare*), peelbark St. John's wort, loosehead beaksedge (*Rhynchospora chalarocephala*), shortbristle horned beaksedge, water toothleaf (*Stillingia aquatica*), Virginia chain fern, and fringed yellow-eyed grass. Other frequently encountered herbaceous species include dotted smartweed, sugarcane plume grass (*Saccharum giganteum*), and yellow-eyed grass (*Xyris* sp.). The tall shrub layer may be sparse to dense and often is dominated by common buttonbush, dahoon holly, wax myrtle, swamp tupelo, coastalplain willow (*Salix caroliniana*), and pond cypress. The sparse canopy layer consists of few isolated trees including red maple, sweetgum (*Liquidambar styraciflua*), and pond cypress. Vines are occasionally found on the edges of the depression marsh community; these include saw greenbrier (*Smilax bona-nox*) and cat greenbrier (*Smilax glauca*).

Dome Swamp (898.11 acres, 1.98%)

Dome swamp is an isolated, forested, depression wetland occurring within a fire-maintained community such as mesic flatwoods. These swamps are generally small but may also be large and shallow. Trees in the center are often taller than those on the edges, giving the stand a dome-shaped profile. Species composition is similar to basin swamps, consisting of swamp tupelo and pond cypress in the canopy with occasional red maple, sweetbay, slash pine, and loblolly pine. The subcanopy is usually sparse, consisting of young trees of the canopy species and swamp bay. The shrub layer may be sparse or dense and consists of fetterbush, titi, wax myrtle, coastal sweet pepperbush, and coastal doghobble. The trees and shrubs often occur on hummocks with bare mucky soil between them. The herb layer is sparse, except in canopy openings, and consists primarily of Jamaica swamp sawgrass, lizard's tail, Virginia chain fern, and Walter's sedge. Soil type is Surrency fine sand, which is acidic (pH 4.0-5.1) at the two-foot depth.

Floodplain Swamp (646.34 acres, 1.42%)

Floodplain swamp is primarily deciduous forest occurring along rivers and larger streams and composed of trees tolerant of prolonged flooding. This forest consists of a closed canopy of tall, straight trees with little shrub or herb layer and large areas of bare mucky soil exposed. At the AWMA, the canopy is dominated by green ash, bald cypress (*Taxodium distichum*), swamp tupelo, and red maple. Large bald cypress stumps, four to five feet in diameter, are frequently encountered. Less common canopy species include sweetbay, sweetgum, and swamp laurel oak

(*Quercus laurifolia*). Subcanopy trees include young trees of the canopy species, particularly green ash, red maple, Carolina ash, and American elm (*Ulmus americana*). The sparse shrub layer is characterized by swamp dogwood (*Cornus foemina*), Virginia willow, dahoon holly, and wax myrtle. The rare Florida willow (*Salix floridana*) occurs in this community around depressions or along the river edge near the head of the Wacissa River. Herbs are generally sparse but may form denser patches in canopy gaps; the most frequent species are millet beaksedge and lizard's tail. Other less frequent species are prairie iris (*Iris hexagona*), spring-run spiderlily (*Hymenocallis rotata*), and false nettle (*Boehmeria cylindrica*). At the AWMA, this community is found as a band along the Wacissa River and is intricately intermingled with the large hydric hammock community occupying a broad depression along the river drainage. Soil type is Nuttall fine sand, which is acidic to neutral (pH 5.1-6.2) at a two-foot depth. Limestone outcrops are frequently encountered.

Hydric Hammock (15,919.32 acres, 35.08%)

Hydric hammock is an evergreen, hardwood and/or palm forest with a variable understory typically dominated by palms and ferns occurring on moist soils, often with limestone very near the surface. While species composition varies, the community generally has a closed canopy of oaks and palms, an open understory, and a sparse to a moderate groundcover of grasses and ferns. Most of the hardwood forest at the AWMA is hydric hammock, which occupies the broad lowland along the Wacissa River. The diverse, closed canopy consists of swamp laurel oak, sweetbay, red maple, American elm, and sweetgum; wetter areas may have green ash, bald cypress, and swamp tupelo. The subcanopy is dominated by sabal palm (*Sabal palmetto*) along with young canopy species. Tall shrubs include American hornbeam (*Carpinus caroliniana*), swamp bay, wax myrtle, swamp dogwood, and red mulberry (*Morus rubra*). Needle palm (*Rhapidophyllum hystrix*) and bluestem palmetto (*Sabal minor*) are often dense and account for most of the short shrub layer. Cover of the herb layer is variable, with southern wood fern (*Dryopteris ludoviciana*), shiny woodoats (*Chasmanthium nitidum*), and sedges (*Carex* spp.) forming occasional dense patches. Millet beaksedge and lizard's tail are present in lower areas. Several terrestrial orchids occur in this community, including the relatively uncommon jug orchid (*Platythelys latifolia*), plus palegreen orchid (*Platanthera flava*) and hairy shadow-witch (*Ponthieva racemosa*). Soils are classified as Nuttall fine sand and limestone outcrops are frequent. Small ponds, including a half-acre lake in the floodplain of the Wacissa River, may represent sinkhole lakes developing in the karst plain that underlies the hydric hammock on the AWMA.

Mesic Flatwoods (421.55 acres, 0.93%)

Mesic flatwoods are open pine savannahs and woodlands occurring on low, flat terrain with a sparse to absent midstory and a diverse shrub and herb layer. Fire is an important factor in maintaining high plant diversity and naturally occurs during the late spring/early summer lightning season. Mesic flatwoods were formerly the primary matrix upland plant community at the AWMA but is now rare, having been largely converted to pine plantation and now in various stages of restoration. Two types of flatwoods are found: 1) the typical flatwoods type with a canopy of longleaf pine (*Pinus palustris*) and slash pine, a short shrub layer of gallberry (*Ilex glabra*) and saw palmetto (*Serenoa repens*), and an herb layer dominated by wiregrass (*Aristida stricta*); and 2) a more unusual type in the ecotone between typical flatwoods and hydric hammock with an open canopy of loblolly pine and a dense to patchy shrub layer of coastalplain staggerbush

(*Lyonia fruticosa*), fetterbush, and saw palmetto. The restoration mesic flatwoods has been thinned and currently contains a canopy of widely spaced slash pine. The shrub layer has also been chopped and for the most part is structurally similar to a natural flatwoods community. Subcanopy cover is sparse, consisting of occasional individual trees of sweetgum, swamp laurel oak, live oak (*Quercus virginiana*), or sabal palm. Tall shrubs are likewise sparse and include titi and wax myrtle, in addition to the subcanopy species listed above. The dense short shrub layer is dominated by saw palmetto, with scattered young sabal palms. Other species in this layer include roundpod St. John's wort (*Hypericum cistifolium*), flatwoods St. John's wort (*Hypericum microsepalum*), large gallberry, yaupon (*Ilex vomitoria*), coastalplain staggerbush, fetterbush, and wax myrtle. The herbaceous layer is found in patchy openings and consists of purple bluestem (*Andropogon glomeratus* var. *glaucopsis*), Jamaica swamp sawgrass, witchgrass (*Dichanthelium* sp.), dogfennel (*Eupatorium capillifolium*), bracken fern (*Pteridium aquilinum*), and nutrush (*Scleria* sp.). Vines include yellow jessamine (*Gelsemium sempervirens*) and muscadine (*Vitis rotundifolia*).

Mesic Hammock (1,640.78 acres, 3.62%)

Mesic hammock is a well-developed evergreen hardwood and/or palm forest on soils that are rarely inundated. At the AWMA, this community is found on narrow to broad transitions between mesic flatwoods and hydric hammock. Extensive mesic hammock can be found in the AWMA sinks area, a low sandy plain with limestone near the surface. It has a closed canopy of live oak, water oak (*Quercus nigra*), sweetgum, and loblolly pine. There is typically a subcanopy of sabal palm and moderately dense to sparse tall shrub layer of wax myrtle, yaupon, and sparkleberry (*Vaccinium arboreum*). Several species of hawthorn (*Crataegus* spp.) are common in the tall shrub layer. The short shrub layer is dominated by often dense saw palmetto. The sparse herb layer includes bracken fern and cinnamon fern (*Osmunda cinnamomea*). This community has a lower diversity of woody species than either the upland hardwood forest or the hydric hammock communities. Vines include earleaf greenbrier (*Smilax auriculata*), cat greenbrier, yellow jessamine, and muscadine. The principal epiphyte is resurrection fern.

Scrubby Flatwoods (2.34 acres, 0.01%)

Scrubby flatwoods have an open canopy of widely spaced pine trees and a low, shrubby understory dominated by scrub oaks and saw palmetto, often interspersed with areas of barren white sand. There are a few small areas of scrubby flatwoods at the AWMA, generally occurring on small rises within the mesic hammock. The canopy is dominated by widely scattered slash pines. The subcanopy layer is sparse, consisting of scattered individuals of sand live oak (*Quercus geminata*), with lesser numbers of live oak and sabal palm. The tall shrub layer is moderately dense, dominated by smaller individuals of sand live oak, coastalplain staggerbush, and wax myrtle. The short shrub layer forms a dense continuous cover dominated by saw palmetto. Other species in this layer are fetterbush and coastalplain staggerbush. Herbaceous species are sparse and patchy, consisting of witchgrass and bracken fern. Epiphytes are uncommon due to the open nature of this community; Spanish moss (*Tillandsia usneoides*) is the only documented epiphyte. Vines are infrequent and include yellow jessamine, earleaf greenbrier, and muscadine.

Sinkhole (0.63 acres, <0.01%)

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. Although they may exist within most natural communities across Florida, which has more sinkholes than any other state, they are most often associated with hardwood forest communities such as mesic hammock and upland hardwood forest in the Florida Panhandle. Sinkholes are present at the AWMA primarily in the Aucilla Sinks area where the Aucilla River runs underground. There is extensive exposed limestone on vertical walls of a series of sinks along the trace of the underground river. The walls are essentially devoid of vascular plants but may include some ferns.

Spring-Run Stream (256.35 acres, 0.56%)

Spring-run stream is a perennial watercourse fed by springs. Spring-run streams are characterized as perennial water courses which derive most, if not all, of their water from artesian openings in the underground aquifer. Waters issuing from the aquifer are generally clear, circumneutral to slightly alkaline (pH 7.0-8.2), and perennially cool (66-75°F). These conditions saturate the water with important minerals, allow light to penetrate deeply, and reduce the limiting effects of environmental fluctuations, all of which are conducive for plant growth. Thus, spring-run streams are among the most productive aquatic habitats. Typical plants within spring-run streams at the AWMA include tape grass (*Vallisneria spiralis*), annual wild rice (*Zizania aquatica*), spatterdock (*Nuphar advena*), and pickerelweed (*Pontederia cordata*). The invasive non-native *Hydrilla verticillata* is abundant.

Upland Hardwood Forest (608.15 acres, 1.34%)

Upland hardwood forest is a well-developed, closed-canopy forest dominated by deciduous hardwood trees on mesic soils in areas sheltered from fire. It typically has a diverse assemblage of deciduous and evergreen tree species in the canopy; shade-tolerant shrubs in the midstory; and a moderate to sparse groundcover. The upland hardwood forest at the AWMA has a closed canopy dominated by water oak, sweetgum, red maple, swamp laurel oak, live oak, and southern magnolia (*Magnolia grandiflora*). Several other common species include pignut hickory (*Carya glabra*), swamp chestnut oak (*Quercus michauxii*), Florida maple (*Acer saccharum* ssp. *floridanum*), spruce pine (*Pinus glabra*), basswood (*Tilia americana*), white oak (*Quercus alba*), American beech (*Fagus grandifolia*), Shumard's oak (*Quercus shumardii*), and white ash (*Fraxinus americana*). The midstory layer is composed of canopy trees of varying heights plus short trees and blends gradually into the tall shrub layer; common species include southern magnolia, American holly (*Ilex opaca* var. *opaca*), American hornbeam, eastern hophornbeam (*Ostrya virginiana*), and American witchhazel (*Hamamelis virginiana*). Other tall shrub species include eastern redbud (*Cercis canadensis*) and yaupon. The short shrub and herb layers are typically sparse, with red buckeye (*Aesculus pavia*) and bluestem palmetto as frequent shrubs. Switchcane (*Arundinaria gigantea*), slender woodoats (*Chasmanthium laxum*), and partridgeberry (*Mitchella repens*) are common in the herb layer.

Wet Flatwoods (382.53 acres, 0.84%)

Wet flatwoods are pine savannas or woodlands on generally flat poorly-drained soils with a sparse or absent midstory and a dense groundcover of hydrophytic grasses, herbs, and low shrubs. This community was once extensive at the AWMA but was replaced by commercial silviculture prior to state-ownership. A large percentage is now classified as restoration wet flatwoods, which now contains many of this community's former components. The few remaining wet flatwoods that were not converted to plantation are generally inaccessible or small patches. These islands have a canopy of slash pine over tall dense clumps of young trees and tall shrubs, including sabal palm, sweetbay, wax myrtle, and saw palmetto. The herb layer is very sparse, consisting primarily of Virginia chain fern. These islands alternate with open areas of Jamaica swamp sawgrass and beaksedges (*Rhynchospora* spp.), plus the subshrubs coastalplain St. John's wort (*Hypericum brachyphyllum*), and water toothleaf.

Altered Landcover Types**Artificial Pond (64.14 acres, 0.14%)**

On the AWMA, artificial ponds or impoundments consist of several run-offs located along the Aucilla Sinks section of the Aucilla River, a black water stream, and the spring-fed Wacissa River.

Developed (11.82 acres, 0.03%)

At the AWMA, developed areas consist of an equipment storage compound facility, five entrance facilities, two boat landings, and a picnic pavilion. The developed areas are within a small footprint and are surrounded by natural vegetation communities.

Firebreak (18.70 acres, 0.04%)

Firebreaks include long-term, routinely maintained features used to limit the spread of fire but not frequently driven except by FWC staff in association with actions related to fire and restoration work.

Linear Feature (0.67 acres, <0.01%)

The linear feature on the AWMA refers to a short, two-track road.

Pasture - Improved (3.98 acres, 0.01%)

Improved pastures are dominated by planted non-native or domesticated native forage species and evidence of current or recent pasture activity and/or cultural treatments (mowing, grazing, burning, fertilizing; Agro-Ecology Grazing Issues Working Group 2009). Improved pastures have been cleared of their native vegetation. Most improved pastures in Florida are planted with bahiagrass (*Paspalum notatum*) and, to a lesser extent, with Bermudagrass (*Cynodon dactylon*) or pangolagrass (*Digitaria eriantha*). Weedy native species are often common in improved pastures in Florida and include dogfennel, many species of flatsedge (*Cyperus* spp.), carpetgrasses (*Axonopus* spp.), crabgrasses (*Digitaria* spp.), and rustweed (*Polypremum procumbens*) among many others. Lawns or turf areas that are being maintained by mowing for human/recreational-use should be classified as developed (see above).

Pine Plantation (1,223.77 acres, 2.70%)

Pine plantations are areas altered by silvicultural activities. These include lands where either 1) planted pines are having or will have an ongoing detrimental effect on native groundcover; 2) the history of planted pines has altered groundcover to the point where further restoration beyond thinning and burning is required; and/or 3) the method of planting (e.g. bedding) has severely impacted groundcover. Pine plantations in Florida are often dominated by even-aged loblolly, sand (*Pinus clausa*), or slash pine. Dense pine plantations typically have sparse to absent herbaceous vegetation because of shading or a cover of deep pine needle duff. These plantations may be very shrubby or vine-dominated or open at ground level. The groundcover in most cases has been severely impacted by mechanical site preparation, such as roller chopping and bedding. However, while perennial grasses such as wiregrass may be greatly reduced, many components of the native groundcover persist even though the relative abundance is altered. Groundcover can be partially restored by thinning and/or frequent burning, although some planting of perennial grasses such as wiregrass may be required. With activities such as thinning and burning, plantations with intact native groundcover can be restored to the former natural community.

Most plantations were planted in the areas of former mesic and wet flatwoods, as shown on the 1949 aerial images of the AWMA. Slash pine is the most common tree planted, with a small area in loblolly pine in the northern portion of the AWMA, east of the Wascissa River. Most plantations have no subcanopy, or just a few scattered trees, often sweetbay, water oak, or sweetgum. Shrub cover is usually moderate to very dense; dense stands are often dominated by titi, black titi, fetterbush, and large gallberry; these are interpreted to have been planted in areas occupied by wet flatwoods and baygall; more open stands tend to be dominated by wax myrtle, saw palmetto, and gallberry and are thought to have been planted in areas of mesic flatwoods or, in a few cases, mesic hammock. Herbaceous cover is generally very sparse; where it is denser, it is dominated by the weedy purple bluestem. Substantial acreage of areas previously mapped as pine plantation are in various stages of restoration and are now typed as restoration natural communities (see below) including restoration wet flatwoods, restoration mesic flatwoods and restoration mesic hammock. Plantations in areas of former mesic hammock have live oak and sweetgum in the subcanopy and occasionally woodoats (*Chasmanthium* sp.) or shortleaf basketgrass (*Oplismenus setarius*) in the herb layer.

Restoration Natural Communities (12,092.75 acres, 27%)

Restoration natural communities are former altered landcover type or successional natural community (pine plantation, xeric hammock, etc.) where active restoration is ongoing to return the community to its historic state. Examples of restoration activities include pine thinning, prescribed fire, longleaf pine planting, groundcover restoration, hydrology restoration, and removal of non-natives and other undesirable vegetation. In historically pyrogenic restoration natural communities, restoration activities are accompanied by the application of prescribed fire. On the AWMA, the natural communities in restoration include mesic flatwoods, mesic hammock, sandhill, scrubby flatwoods, upland hardwood forest, wet flatwoods, and wet prairie.

Wet prairie is an herbaceous community found on continuously wet, but not inundated, soils on somewhat flat or gentle slopes often associated with other wetland communities as ecotones or

wetlands corridors. Wet prairie formerly occurred at the AWMA on the edges of basin swamps, dome swamps, and hydric hammocks that are now dominated by black titi, titi, and other baygall vegetation. In its natural state, it is typically dominated by dense wiregrass in the drier portions, along with foxtail club-moss (*Lycopodiella alopecuroides*), hairawn muhly (*Muhlenbergia capillaris*), yellow-flowered butterwort (*Pinguicula lutea*), and savannah meadowbeauty (*Rhexia alifanus*). In the wetter portions, wiregrass may occur with, or be replaced by, species in the sedge family, such as plumed beaksedge (*Rhynchospora plumosa*), featherbristle beaksedge (*R. oligantha*), Baldwin's nutrush (*Scleria baldwinii*), slenderfruit nutrush (*Scleria georgiana*), and longleaf threeawn (*Aristida palustris*). Also common in wetter areas are carnivorous species, including pitcherplants (*Sarracenia* spp.), sundews (*Drosera* spp.), butterworts (*Pinguicula* spp.), and bladderworts (*Utricularia* spp.). Other characteristic species in this community include toothache grass (*Ctenium aromaticum*), pineland rayless goldenrod (*Bigelowia nudata* ssp. *nudata*), flattened pipewort (*Eriocaulon compressum*), water cowbane (*Tiedemannia filiformis*), and coastalplain yellow-eyed grass (*Xyris ambigua*).

Information on restoration mesic flatwoods and restoration wet flatwoods can be found in their respective descriptions above.

Road (593.36 acres, 1.31%)

Roads are cleared ruderal areas used for access that are either paved or unpaved. On the AWMA, there are a variety of primary, secondary service roads, and a County Road traversing the area. There are approximately 120 miles of road within the AWMA with hiking, bicycling, and horseback riding allowed on all of them.

Utility Corridor (29.11 acres, 0.06%)

Utility corridors on the AWMA include two access easements and a utility easement with Progress Energy, Inc.

11.8 Native Plant and Wildlife Species Lists

11.8.1 Native Plant Species

Scientific Name	Common Name
<i>Acer negundo</i>	Boxelder
<i>Acer rubrum</i>	Red maple
<i>Acer saccharum</i> ssp. <i>floridanum</i>	Florida maple
<i>Aesculus pavia</i>	Red buckeye
<i>Agalinis fasciculata</i>	Beach false foxglove
<i>Aletris lutea</i>	Yellow colic-root
<i>Aletris obovata</i>	Southern colic-root
<i>Aletris</i> sp.	Colic-root
<i>Alnus serrulata</i>	Hazel alder
<i>Amelanchier arborea</i>	Common serviceberry
<i>Amorpha fruticosa</i>	False indigobush

Scientific Name	Common Name
<i>Amsonia tabernaemontana</i>	Eastern bluestar
<i>Andropogon arctatus</i>	Pine-woods bluestem
<i>Andropogon glomeratus</i>	Bushy bluestem
<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>	Purple bluestem
<i>Andropogon gyrans</i>	Elliott's bluestem
<i>Andropogon</i> sp.	Bluestem
<i>Andropogon ternarius</i>	Splitbeard bluestem
<i>Andropogon virginicus</i> var. <i>glaucus</i>	Chalky bluestem
<i>Andropogon virginicus</i> var. <i>virginicus</i>	Broomsedge bluestem
<i>Apios americana</i>	Groundnut
<i>Apteria aphylla</i>	Nodding nixie
<i>Aralia spinosa</i>	Devil's walkingstick
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit
<i>Aristida purpurascens</i> var. <i>purpurascens</i>	Arrowfeather threeawn
<i>Aristida spiciformis</i>	Bottlebrush threeawn
<i>Aristida stricta</i>	Wiregrass
<i>Aristolochia serpentaria</i>	Virginia snakeroot
<i>Arnoglossum ovatum</i>	Ovateleaf Indian-plantain
<i>Aronia arbutifolia</i>	Red chokeberry
<i>Arundinaria gigantea</i>	Switchcane
<i>Asclepias lanceolata</i>	Fewflower milkweed
<i>Asclepias pedicellata</i>	Savannah milkweed
<i>Asclepias perennis</i>	Swamp milkweed
<i>Asclepias tuberosa</i>	Butterflyweed
<i>Asclepias variegata</i>	Redring milkweed
<i>Asemeia violacea</i>	Showy milkwort
<i>Asimina angustifolia</i>	Slimleaf pawpaw
<i>Asimina parviflora</i>	Smallflower pawpaw
<i>Asimina spatulata</i>	Pawpaw
<i>Asplenium platyneuron</i>	Ebony spleenwort
<i>Athyrium filix-femina</i>	Southern lady fern
<i>Axonopus furcatus</i>	Big carpetgrass
<i>Azolla filiculoides</i>	American waterfern
<i>Baccharis halimifolia</i>	Groundsel tree
<i>Balduina uniflora</i>	Oneflower honeycomb-head
<i>Baptisia alba</i>	White wild indigo
<i>Berchemia scandens</i>	Rattan vine
<i>Betula nigra</i>	River birch
<i>Bidens alba</i>	Beggarticks

Scientific Name	Common Name
<i>Bidens bipinnata</i>	Spanish needles
<i>Bidens mitis</i>	Smallfruit beggarticks
<i>Bigelovia nudata</i> ssp. <i>nudata</i>	Pineland rayless goldenrod
<i>Bignonia capreolata</i>	Crossvine
<i>Boehmeria cylindrica</i>	False nettle
<i>Boltonia diffusa</i>	Smallhead doll's daisy
<i>Botrychium biternatum</i>	Southern grape-fern
<i>Callicarpa americana</i>	American beautyberry
<i>Calopogon tuberosus</i> var. <i>tuberosus</i>	Tuberous grass-pink
<i>Campsis radicans</i>	Trumpet creeper
<i>Cardamine pensylvanica</i>	Pennsylvania bittercress
<i>Carex atlantica</i> ssp. <i>capillacea</i>	Prickly bog sedge
<i>Carex chapmannii</i>	Chapman's sedge
<i>Carex cherokeensis</i>	Cherokee sedge
<i>Carex elliotii</i>	Elliott's sedge
<i>Carex gigantea</i>	Giant sedge
<i>Carex glaucescens</i>	Clustered sedge
<i>Carex leptalea</i>	Bristlystalked sedge
<i>Carex longii</i>	Long's sedge
<i>Carex louisianica</i>	Louisiana sedge
<i>Carex lupuliformis</i>	False hop sedge
<i>Carex lupulina</i>	Hop sedge
<i>Carex mitchelliana</i>	Mitchell's sedge
<i>Carex</i> sp.	Sedge
<i>Carex stipata</i>	Owlfruit sedge
<i>Carex striata</i>	Walter's sedge
<i>Carex verrucosa</i>	Warty sedge
<i>Carphephorus odoratissimus</i>	Vanillaleaf
<i>Carphephorus paniculatus</i>	Hairy chaffhead
<i>Carpinus caroliniana</i>	American hornbeam
<i>Carpinus</i> sp.	Hornbeam
<i>Cartrema americanum</i>	Wild olive
<i>Carya aquatica</i>	Water hickory
<i>Carya glabra</i>	Pignut hickory
<i>Carya tomentosa</i>	Mockernut hickory
<i>Castanea pumila</i>	Chinquapin
<i>Catalpa bignonioides</i>	Southern catalpa
<i>Ceanothus americanus</i>	New Jersey tea
<i>Celtis laevigata</i>	Sugarberry

Scientific Name	Common Name
<i>Centella asiatica</i>	Spadeleaf
<i>Centrosema arenicola</i>	Sand butterfly pea
<i>Centrosema virginianum</i>	Spurred butterfly pea
<i>Cephalanthus occidentalis</i>	Common buttonbush
<i>Cercis canadensis</i>	Eastern redbud
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Chamaecrista nictitans</i>	Sensitive pea
<i>Chaptalia tomentosa</i>	Pineland daisy
<i>Chasmanthium laxum</i>	Slender woodoats
<i>Chasmanthium nitidum</i>	Shiny woodoats
<i>Chasmanthium sessiliflorum</i>	Longleaf woodoats
<i>Chasmanthium</i> sp.	Woodoats
<i>Chimaphila maculata</i>	Spotted wintergreen
<i>Chionanthus virginicus</i>	White fringe tree
<i>Cicuta maculata</i>	Spotted water hemlock
<i>Cirsium horridulum</i>	Purple thistle
<i>Cirsium lecontei</i>	Le Conte's thistle
<i>Cladina subtenuis</i>	Reindeer lichen
<i>Cladium jamaicense</i>	Jamaica swamp sawgrass
<i>Cleistes divaricata</i>	Spreading pogonia
<i>Clematis crispa</i>	Swamp leather flower
<i>Clematis virginiana</i>	Virginsbower
<i>Clethra alnifolia</i>	Coastal sweet pepperbush
<i>Cliftonia monophylla</i>	Black titi
<i>Cnidoscolus stimulosus</i>	Tread-softly
<i>Coleataenia anceps</i>	Beaked panicum
<i>Coleataenia longifolia</i>	Ciliate redtop panicum
<i>Coleataenia rigidula</i>	Redtop panicum
<i>Collinsonia serotina</i>	Blueridge horsebalm
<i>Commelina virginica</i>	Virginia dayflower
<i>Conoclinium coelestinum</i>	Blue mistflower
<i>Corallorhiza wisteriana</i>	Spring coralroot
<i>Coreopsis floridana</i>	Florida tickseed
<i>Coreopsis nudata</i>	Georgia tickseed
<i>Cornus florida</i>	Flowering dogwood
<i>Cornus foemina</i>	Swamp dogwood
<i>Crataegus aestivalis</i>	May haw
<i>Crataegus crus-galli</i>	Cockspur hawthorn
<i>Crataegus marshallii</i>	Parsley hawthorn

Scientific Name	Common Name
<i>Crataegus</i> sp.	Hawthorn
<i>Crataegus spathulata</i>	Littlehip hawthorn
<i>Crataegus viridis</i>	Green hawthorn
<i>Crinum americanum</i>	String lily
<i>Crotalaria rotundifolia</i>	Rabbitbells
<i>Croton glandulosus</i> var. <i>septentrionalis</i>	Vente conmigo
<i>Cyperus compressus</i>	Poorland flatsedge
<i>Cyperus haspan</i>	Haspan flatsedge
<i>Cyperus odoratus</i>	Fragrant flatsedge
<i>Cyperus ovatus</i>	Pinebarren flatsedge
<i>Cyperus polystachyos</i>	Manyspike flatsedge
<i>Cyperus sesquiflorus</i>	Fragrant spikesedge
<i>Cyperus virens</i>	Green flatsedge
<i>Cyrilla racemiflora</i>	Titi
<i>Dalea pinnata</i> var. <i>pinnata</i>	Summer farewell
<i>Decodon verticillatus</i>	Willow-herb
<i>Dicerandra linearifolia</i> var. <i>robustior</i>	Coastalplain balm
<i>Dichanthelium aciculare</i>	Needleleaf witchgrass
<i>Dichanthelium acuminatum</i> var. <i>acuminatum</i>	Tapered witchgrass
<i>Dichanthelium commutatum</i>	Variable witchgrass
<i>Dichanthelium dichotomum</i>	Cypress panicgrass
<i>Dichanthelium ensifolium</i> var. <i>ensifolium</i>	Cypress witchgrass
<i>Dichanthelium portoricense</i>	Hemlock witchgrass
<i>Dichanthelium scabriusculum</i>	Woolly witchgrass
<i>Dichanthelium scoparium</i>	Velvet witchgrass
<i>Dichanthelium</i> sp.	Witchgrass
<i>Dichanthelium sphaerocarpon</i>	Roundseed witchgrass
<i>Dichondra</i> sp.	Ponysfoot
<i>Diodia virginiana</i>	Virginia buttonweed
<i>Dioscorea floridana</i>	Florida yam
<i>Diospyros virginiana</i>	Common persimmon
<i>Ditrysinia fruticosa</i>	Gulf Sebastian-bush
<i>Drosera brevifolia</i>	Dwarf sundew
<i>Drosera capillaris</i>	Pink sundew
<i>Drosera</i> sp.	Sundew
<i>Dryopteris ludoviciana</i>	Southern wood fern
<i>Dulichium arundinaceum</i>	Threeway sedge
<i>Dyschoriste humistrata</i>	Swamp twinflower
<i>Dyschoriste oblongifolia</i>	Oblongleaf twinflower

Scientific Name	Common Name
<i>Edrastrima uniflora</i>	Clustered mille grains
<i>Eleocharis baldwinii</i>	Baldwin's spikerush
<i>Eleocharis equisetoides</i>	Jointed spikerush
<i>Elephantopus elatus</i>	Tall elephantsfoot
<i>Elytraria caroliniensis</i>	Carolina scalystem
<i>Epidendrum conopseum</i>	Green-fly orchid
<i>Equisetum hyemale</i> var. <i>affine</i>	Scouring rush
<i>Eragrostis refracta</i>	Coastal lovegrass
<i>Erigeron annuus</i>	Easter daisy fleabane
<i>Erigeron canadensis</i>	Canadian horseweed
<i>Erigeron vernus</i>	Early whitetop fleabane
<i>Eriocaulon compressum</i>	Flattened pipewort
<i>Eriocaulon decangulare</i>	Tenangle pipewort
<i>Eriogonum tomentosum</i>	Dogtongue wild buckwheat
<i>Eryngium aquaticum</i>	Rattlesnakemaster
<i>Eryngium aromaticum</i>	Fragrant eryngo
<i>Eryngium integrifolium</i>	Blueflower eryngo
<i>Eryngium prostratum</i>	Creeping eryngo
<i>Eryngium yuccifolium</i>	Button rattlesnakemaster
<i>Erythrina herbacea</i>	Coralbean
<i>Eubotrys racemosus</i>	Swamp doghobble
<i>Euonymus americanus</i>	American strawberrybush
<i>Eupatorium album</i>	White thoroughwort
<i>Eupatorium capillifolium</i>	Dogfennel
<i>Eupatorium compositifolium</i>	Yankeeweed
<i>Eupatorium mohrii</i>	Mohr's thoroughwort
<i>Eupatorium perfoliatum</i>	Common boneset
<i>Eupatorium rotundifolium</i>	Roundleaf thoroughwort
<i>Eupatorium serotinum</i>	Lateflowering thoroughwort
<i>Euphorbia heterophylla</i>	Fiddler's spurge
<i>Euphorbia hirta</i>	Pillpod sandmat
<i>Euphorbia hyssopifolia</i>	Hyssopleaf sandmat
<i>Euphorbia maculata</i>	Spotted sandmat
<i>Eustachys glauca</i>	Saltmarsh fingergrass
<i>Eustachys petraea</i>	Pinewoods fingergrass
<i>Euthamia caroliniana</i>	Slender flattop goldenrod
<i>Euthamia graminifolia</i>	Flattop goldenrod
<i>Fagus grandifolia</i>	American beech
<i>Forestiera acuminata</i>	Eastern swampprivet

Scientific Name	Common Name
<i>Fraxinus americana</i>	White ash
<i>Fraxinus caroliniana</i>	Carolina ash
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Fraxinus</i> sp.	Ash
<i>Froelichia floridana</i>	Cottonweed
<i>Fuirena breviseta</i>	Saltmarsh umbrellasedge
<i>Fuirena scirpoidea</i>	Southern umbrellasedge
<i>Galactia floridana</i>	Florida milkpea
<i>Gaylussacia dumosa</i>	Dwarf huckleberry
<i>Gaylussacia frondosa</i>	Blue huckleberry
<i>Gaylussacia mosieri</i>	Woolly huckleberry
<i>Gelsemium sempervirens</i>	Yellow jessamine
<i>Geobalanus oblongifolius</i>	Gopher apple
<i>Gleditsia aquatica</i>	Water locust
<i>Gleditsia</i> sp.	Locust
<i>Gleditsia triacanthos</i>	Honey locust
<i>Gordonia lasianthus</i>	Loblolly bay
<i>Habenaria repens</i>	Waterspider false rein orchid
<i>Halesia carolina</i>	Carolina silverbell
<i>Halesia</i> sp.	Silverbell
<i>Hamamelis virginiana</i>	American witchhazel
<i>Helenium amarum</i>	Spanish daisy
<i>Helenium autumnale</i>	Common sneezeweed
<i>Helenium flexuosum</i>	Purplehead sneezeweed
<i>Helenium pinnatifidum</i>	Southeastern sneezeweed
<i>Helianthus angustifolius</i>	Narrowleaf sunflower
<i>Helianthus heterophyllus</i>	Variableleaf sunflower
<i>Helianthus radula</i>	Stiff sunflower
<i>Helianthus strumosus</i>	Paleleaf woodland sunflower
<i>Hexastylis arifolia</i>	Heartleaf wild ginger
<i>Hibiscus aculeatus</i>	Comfortroot
<i>Hibiscus coccineus</i>	Scarlet rosemallow
<i>Hibiscus moscheutos</i>	Crimson-eyed rosemallow
<i>Hieracium gronovii</i>	Queen-devil
<i>Hydrangea barbara</i>	Climbing hydrangea
<i>Hydrocotyle bonariensis</i>	Largeleaf marshpennywort
<i>Hydrocotyle</i> sp.	Marshpennywort
<i>Hydrocotyle umbellata</i>	Manyflower marshpennywort
<i>Hydrocotyle verticillata</i> var. <i>verticillata</i>	Whorled marshpennywort

Scientific Name	Common Name
<i>Hydrolea corymbosa</i>	Skyflower
<i>Hydrolea quadrivalvis</i>	Waterpod
<i>Hymenocallis rotata</i>	Spring-run spiderlily
<i>Hymenocallis</i> sp.	Spiderlily
<i>Hypericum brachyphyllum</i>	Coastalplain St. John's wort
<i>Hypericum canadense</i>	Lesser canadian St. John's wort
<i>Hypericum chapmanii</i>	Chapman's St. John's wort
<i>Hypericum cistifolium</i>	Roundpod St. John's wort
<i>Hypericum crux-andreae</i>	St. Peter's wort
<i>Hypericum fasciculatum</i>	Peelbark St. John's wort
<i>Hypericum galioides</i>	Bedstraw St. John's wort
<i>Hypericum gentianoides</i>	Orangegrass
<i>Hypericum gymnanthum</i>	Claspingleaf St. John's wort
<i>Hypericum hypericoides</i>	St. Andrew's cross
<i>Hypericum microsepalum</i>	Flatwoods St. John's wort
<i>Hypericum mutilum</i>	Dwarf St. John's wort
<i>Hypericum myrtifolium</i>	Myrtleleaf St. John's wort
<i>Hypericum punctatum</i>	Spotted St. John's wort
<i>Hypericum setosum</i>	Hairy St. John's wort
<i>Hypericum</i> sp.	St. John's wort
<i>Hypericum suffruticosum</i>	Pineland St. John's wort
<i>Hypericum tenuifolium</i>	Atlantic St. John's wort
<i>Hypericum tetrapetalum</i>	Fourpetal St. John's wort
<i>Hypericum virginicum</i>	Virginia marsh St. John's wort
<i>Hyptis alata</i>	Clustered bushmint
<i>Ilex cassine</i> var. <i>cassine</i>	Dahoon holly
<i>Ilex cassine</i> var. <i>myrtifolia</i>	Myrtle-leaved holly
<i>Ilex coriacea</i>	Large gallberry
<i>Ilex decidua</i>	Swamp holly
<i>Ilex glabra</i>	Gallberry
<i>Ilex opaca</i> var. <i>opaca</i>	American holly
<i>Ilex vomitoria</i>	Yaupon
<i>Indigofera caroliniana</i>	Carolina indigo
<i>Ipomoea cordatotriloba</i>	Tievine
<i>Ipomoea hederifolia</i>	Scarletcreeper
<i>Ipomoea lacunosa</i>	Whitestar
<i>Ipomoea pandurata</i>	Man-of-the-earth
<i>Ipomoea sagittata</i>	Saltmarsh morning glory
<i>Iris hexagona</i>	Prairie iris

Scientific Name	Common Name
<i>Iris savannarum</i>	Savanna iris
<i>Iris</i> sp.	Iris
<i>Itea virginica</i>	Virginia willow
<i>Jacquemontia tamnifolia</i>	Hairy clustervine
<i>Juncus coriaceus</i>	Leathery rush
<i>Juncus effusus</i> ssp. <i>solutus</i>	Soft rush
<i>Juncus marginatus</i>	Grassleaf rush
<i>Juncus megacephalus</i>	Bighead rush
<i>Juncus repens</i>	Lesser creeping rush
<i>Juncus roemerianus</i>	Needle rush
<i>Juncus scirpoides</i>	Needlepod rush
<i>Juncus</i> sp.	Rush
<i>Juniperus virginiana</i>	Red cedar
<i>Justicia angusta</i>	Pineland water-willow
<i>Justicia ovata</i> var. <i>ovata</i>	Looseflower water-willow
<i>Kalmia hirsuta</i>	Hairy laurel
<i>Kellochloa verrucosa</i>	Warty panicgrass
<i>Lachnanthes caroliana</i>	Carolina redroot
<i>Lachnanthes</i> sp.	Redroot
<i>Lachnocaulon anceps</i>	Whitehead bogbutton
<i>Lachnocaulon beyrichianum</i>	Southern bogbutton
<i>Lachnocaulon minus</i>	Small's bogbutton
<i>Leitneria floridana</i>	Corkwood
<i>Lemna valdiviana</i>	Valdivia duckweed
<i>Lespedeza angustifolia</i>	Narrowleaf lespedeza
<i>Lespedeza hirta</i>	Hairy lespedeza
<i>Leucothoe axillaris</i>	Coastal doghobble
<i>Liatris elegantula</i>	Grassleaf gayfeather
<i>Liatris gracilis</i>	Slender gayfeather
<i>Liatris spicata</i>	Dense gayfeather
<i>Lilium catesbaei</i>	Catesby lily
<i>Liquidambar styraciflua</i>	Sweetgum
<i>Liriodendron tulipifera</i>	Tuliptree
<i>Listera australis</i>	Southern twayblade
<i>Lobelia cardinalis</i>	Cardinal flower
<i>Lobelia glandulosa</i>	Glade lobelia
<i>Lonicera sempervirens</i>	Trumpet honeysuckle
<i>Lophiola aurea</i>	Golden crest
<i>Ludwigia alata</i>	Winged primrosewillow

Scientific Name	Common Name
<i>Ludwigia alternifolia</i>	Seedbox
<i>Ludwigia arcuata</i>	Piedmont primrosewillow
<i>Ludwigia erecta</i>	Yerba de jicotea
<i>Ludwigia lanceolata</i>	Lanceleaf primrosewillow
<i>Ludwigia linifolia</i>	Southeastern primrosewillow
<i>Ludwigia maritima</i>	Seaside primrosewillow
<i>Ludwigia microcarpa</i>	Smallfruit primrosewillow
<i>Ludwigia palustris</i>	Marsh seedbox
<i>Ludwigia pilosa</i>	Hairy primrosewillow
<i>Ludwigia repens</i>	Creeping primrosewillow
<i>Ludwigia</i> sp.	Primrosewillow
<i>Ludwigia sphaerocarpa</i>	Globefruit primrosewillow
<i>Ludwigia suffruticosa</i>	Shrubby primrosewillow
<i>Ludwigia virgata</i>	Savannah primrosewillow
<i>Lycium carolinianum</i>	Christmasberry
<i>Lycopodiella alopecuroides</i>	Foxtail club-moss
<i>Lycopodiella caroliniana</i>	Slender club-moss
<i>Lycopus rubellus</i>	Taperleaf waterhorehound
<i>Lycopus virginicus</i>	Virginia waterhorehound
<i>Lyonia ferruginea</i>	Rusty staggerbush
<i>Lyonia fruticosa</i>	Coastalplain staggerbush
<i>Lyonia ligustrina</i> var. <i>foliosiflora</i>	Maleberry
<i>Lyonia lucida</i>	Fetterbush
<i>Lythrum lineare</i>	Wand loosestrife
<i>Magnolia grandiflora</i>	Southern magnolia
<i>Magnolia virginiana</i>	Sweetbay
<i>Malus angustifolia</i>	Crabapple
<i>Marchantia inflexa</i>	a Marchantia liverwort
<i>Marshallia graminifolia</i>	Grassleaf barbara's buttons
<i>Matelea gonocarpos</i>	Angle pod
<i>Melanthra nivea</i>	Snow squarestem
<i>Melothria pendula</i>	Creeping cucumber
<i>Mikania scandens</i>	Climbing hempvine
<i>Mitchella repens</i>	Partridgeberry
<i>Mitreola petiolata</i>	Lax hornpod
<i>Mitreola sessilifolia</i>	Swamp hornpod
<i>Monarda punctata</i>	Spotted beebalm
<i>Morella caroliniensis</i>	Evergreen bayberry
<i>Morella cerifera</i>	Wax myrtle

Scientific Name	Common Name
<i>Morella</i> sp.	Bayberry
<i>Morus rubra</i>	Red mulberry
<i>Muhlenbergia capillaris</i>	Hairawn muhly
<i>Nekemias arborea</i>	Peppervine
<i>Nymphaea odorata</i>	White waterlily
<i>Nyssa aquatica</i>	Water tupelo
<i>Nyssa sylvatica</i> var. <i>biflora</i>	Swamp tupelo
<i>Nyssa sylvatica</i> var. <i>sylvatica</i>	Blackgum
<i>Oclemena reticulata</i>	Pinebarren aster
<i>Oenothera biennis</i>	Common eveningprimrose
<i>Oenothera laciniata</i>	Cutleaf eveningprimrose
<i>Oenothera simulans</i>	Southern beeblossom
<i>Onoclea sensibilis</i>	Sensitive fern
<i>Oplismenus setarius</i>	Shortleaf basketgrass
<i>Orontium aquaticum</i>	Goldenclub
<i>Osmunda cinnamomea</i>	Cinnamon fern
<i>Osmunda regalis</i>	Royal fern
<i>Ostrya virginiana</i>	Eastern hophornbeam
<i>Oxydendrum arboreum</i>	Sourwood
<i>Packera glabella</i>	Butterweed
<i>Panicum capillare</i>	Witchgrass
<i>Panicum dichotomiflorum</i>	Fall panicgrass
<i>Panicum hemitomon</i>	Mountain panic
<i>Panicum</i> sp.	Panic grass
<i>Panicum virgatum</i>	Switchgrass
<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Paspalum setaceum</i>	Thin paspalum
<i>Passiflora incarnata</i>	Purple passion-flower
<i>Passiflora lutea</i>	Yellow passion-flower
<i>Peltandra virginica</i>	Green arrow arum
<i>Persea borbonia</i>	Red bay
<i>Persea borbonia</i> var. <i>borbonia</i>	Red bay
<i>Persea palustris</i>	Swamp bay
<i>Persicaria glabra</i>	Denseflower knotweed
<i>Persicaria hydropiperoides</i>	Swamp smartweed
<i>Persicaria punctata</i>	Dotted smartweed
<i>Persicaria setacea</i>	Bog smartweed
<i>Phanopyrum gymnocarpon</i>	Savannah panicum
<i>Phlox floridana</i>	Florida phlox

Scientific Name	Common Name
<i>Phoradendron leucarpum</i>	Oak mistletoe
<i>Pieris phylllyreifolia</i>	Climbing fetterbush
<i>Pinguicula caerulea</i>	Blue-flowered butterwort
<i>Pinguicula pumila</i>	Small butterwort
<i>Pinus elliotii</i>	Slash pine
<i>Pinus glabra</i>	Spruce pine
<i>Pinus palustris</i>	Longleaf pine
<i>Pinus serotina</i>	Pond pine
<i>Pinus taeda</i>	Loblolly pine
<i>Pityopsis graminifolia</i>	Narrowleaf silkgrass
<i>Planera aquatica</i>	Planer tree
<i>Platanthera chapmanii</i>	Chapman's fringed orchid
<i>Platanthera flava</i>	Palegreen orchid
<i>Platanus occidentalis</i>	American sycamore
<i>Platythelys latifolia</i>	Jug orchid
<i>Pleopeltis michauxiana</i>	Resurrection fern
<i>Pleopeltis polypodioides</i>	Tropical resurrection fern
<i>Pluchea baccharis</i>	Rosy camphorweed
<i>Pluchea camphorata</i>	Camphorweed
<i>Pluchea foetida</i>	Stinking camphorweed
<i>Pluchea</i> sp.	Camphorweed
<i>Polygala crenata</i>	Scalloped milkwort
<i>Polygala cruciata</i>	Drumheads
<i>Polygala cymosa</i>	Tall pinebarren milkwort
<i>Polygala incarnata</i>	Procession flower
<i>Polygala lutea</i>	Orange milkwort
<i>Polygala nana</i>	Candyroot
<i>Polygonum pinicola</i>	Tall jointweed
<i>Polygonum</i> sp.	Knotweed
<i>Polystichum acrostichoides</i>	Christmas fern
<i>Pontederia cordata</i>	Pickernelweed
<i>Ponthieva racemosa</i>	Hairy shadow-witch
<i>Populus deltoides</i>	Eastern cottonwood
<i>Proserpinaca palustris</i>	Marsh mermaidweed
<i>Proserpinaca pectinata</i>	Combleaf mermaidweed
<i>Prunus caroliniana</i>	Carolina laurelcherry
<i>Prunus serotina</i>	Alabama black cherry
<i>Prunus umbellata</i>	Flatwoods plum
<i>Pseudognaphalium obtusifolium</i>	Sweet everlasting

Scientific Name	Common Name
<i>Ptelea trifoliata</i>	Common hoptree
<i>Pteridium aquilinum</i>	Bracken fern
<i>Pterocaulon pycnostachyum</i>	Blackroot
<i>Pyrrhopappus carolinianus</i>	Carolina desertchicory
<i>Quercus alba</i>	White oak
<i>Quercus falcata</i>	Southern red oak
<i>Quercus geminata</i>	Sand live oak
<i>Quercus hemisphaerica</i>	Laurel oak
<i>Quercus laevis</i>	Turkey oak
<i>Quercus laurifolia</i>	Swamp laurel oak
<i>Quercus margarettae</i>	Sand post oak
<i>Quercus michauxii</i>	Swamp chestnut oak
<i>Quercus minima</i>	Dwarf live oak
<i>Quercus myrtifolia</i>	Myrtle oak
<i>Quercus nigra</i>	Water oak
<i>Quercus pumila</i>	Runner oak
<i>Quercus shumardii</i>	Shumard's oak
<i>Quercus stellata</i>	Post oak
<i>Quercus velutina</i>	Black oak
<i>Quercus virginiana</i>	Live oak
<i>Rhapidophyllum hystrix</i>	Needle palm
<i>Rhexia alifanus</i>	Savannah meadowbeauty
<i>Rhexia mariana</i>	Pale meadowbeauty
<i>Rhexia nashii</i>	Maid Marian
<i>Rhexia nuttallii</i>	Nuttall's meadowbeauty
<i>Rhexia petiolata</i>	Fringed meadowbeauty
<i>Rhexia</i> sp.	Meadowbeauty
<i>Rhexia virginica</i>	Handsome harry
<i>Rhododendron canescens</i>	Pink azalea
<i>Rhododendron</i> sp.	Azalea
<i>Rhododendron viscosum</i>	Swamp azalea
<i>Rhus copallinum</i>	Winged sumac
<i>Rhynchosia reniformis</i>	Dollarleaf
<i>Rhynchosia tomentosa</i>	Twining snoutbean
<i>Rhynchospora cephalantha</i>	Bunched beaksedge
<i>Rhynchospora chalarocephala</i>	Loosehead beaksedge
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge
<i>Rhynchospora ciliaris</i>	Fringed beaksedge
<i>Rhynchospora colorata</i>	Starrush white-top

Scientific Name	Common Name
<i>Rhynchospora corniculata</i>	Shortbristle horned beaksedge
<i>Rhynchospora decurrens</i>	Swampforest beaksedge
<i>Rhynchospora divergens</i>	Spreading beaksedge
<i>Rhynchospora elliottii</i>	Elliott's beaksedge
<i>Rhynchospora fascicularis</i>	Fascicled beaksedge
<i>Rhynchospora inundata</i>	Narrowfruit horned beaksedge
<i>Rhynchospora latifolia</i>	Giant white-top
<i>Rhynchospora microcarpa</i>	Southern beaksedge
<i>Rhynchospora microcephala</i>	Smallhead beaksedge
<i>Rhynchospora miliacea</i>	Millet beaksedge
<i>Rhynchospora plumosa</i>	Plumed beaksedge
<i>Rhynchospora</i> sp.	Beaksedge
<i>Rhynchospora wrightiana</i>	Wright's beaksedge
<i>Rosa palustris</i>	Swamp rose
<i>Rubus cuneifolius</i>	Sand blackberry
<i>Rubus pensilvanicus</i>	Sawtooth blackberry
<i>Rubus</i> sp.	Blackberry
<i>Rubus trivialis</i>	Southern dewberry
<i>Rudbeckia hirta</i>	Blackeyed susan
<i>Rudbeckia laciniata</i>	Cutleaf coneflower
<i>Rudbeckia mohrii</i>	Mohr's coneflower
<i>Rudbeckia</i> sp.	Coneflower
<i>Ruellia caroliniensis</i>	Carolina wild petunia
<i>Rumex hastatulus</i>	Heartwing dock
<i>Sabal minor</i>	Bluestem palmetto
<i>Sabal palmetto</i>	Sabal palm
<i>Sabatia brevifolia</i>	Shortleaf rosegentian
<i>Sabatia calycina</i>	Coastal rosegentian
<i>Sabatia campanulata</i>	Slender rosegentian
<i>Sabatia dodecandra</i>	Marsh rosegentian
<i>Sabatia</i> sp.	Rosegentian
<i>Saccharum baldwinii</i>	Narrow plumegrass
<i>Saccharum giganteum</i>	Sugarcane plumegrass
<i>Sageretia minutiflora</i>	Smallflower mock buckthorn
<i>Sagittaria graminea</i>	Grassy arrowhead
<i>Sagittaria lancifolia</i>	Bulltongue arrowhead
<i>Salix caroliniana</i>	Coastalplain willow
<i>Salix floridana</i>	Florida willow
<i>Salvia azurea</i>	Azure blue sage

Scientific Name	Common Name
<i>Salvia lyrata</i>	Lyreleaf sage
<i>Sambucus nigra</i> ssp. <i>canadensis</i>	Elderberry
<i>Sanicula canadensis</i>	Canadian blacksnakeroot
<i>Sarracenia minor</i>	Hooded pitcherplant
<i>Sarracenia psittacina</i>	Parrot pitcherplant
<i>Sassafras albidum</i>	Sassafras
<i>Saururus cernuus</i>	Lizard's tail
<i>Schizachyrium scoparium</i>	Little bluestem
<i>Schizachyrium stoloniferum</i>	Creeping little bluestem
<i>Schoenoplectus californicus</i>	Giant bulrush
<i>Scirpus cyperinus</i>	Woolgrass
<i>Scirpus lineatus</i>	Drooping bulrush
<i>Scleria baldwinii</i>	Baldwin's nutrush
<i>Scleria oligantha</i>	Littlehead nutrush
<i>Scleria reticularis</i>	Netted nutrush
<i>Scleria</i> sp.	Nutrush
<i>Scleria triglomerata</i>	Whip nutrush
<i>Scutellaria integrifolia</i>	Helmet skullcap
<i>Senna obtusifolia</i>	Coffeeweed
<i>Serenoa repens</i>	Saw palmetto
<i>Sesbania herbacea</i>	Danglepod
<i>Sesbania vesicaria</i>	Bladderpod
<i>Seymeria cassioides</i>	Yaupon blacksen
<i>Sida rhombifolia</i>	Cuban jute
<i>Sideroxylon lanuginosum</i>	Gum bully
<i>Sideroxylon reclinatum</i>	Florida bully
<i>Silphium asteriscus</i>	Starry rosinweed
<i>Smilax auriculata</i>	Earleaf greenbrier
<i>Smilax bona-nox</i>	Saw greenbrier
<i>Smilax glauca</i>	Cat greenbrier
<i>Smilax lasioneuron</i>	Blueridge carrionflower
<i>Smilax laurifolia</i>	Laurel greenbrier
<i>Smilax pumila</i>	Sarsaparilla vine
<i>Smilax rotundifolia</i>	Roundleaf greenbrier
<i>Smilax smallii</i>	Lanceleaf greenbrier
<i>Smilax</i> sp.	Greenbrier
<i>Smilax tamnoides</i>	Bristly greenbrier
<i>Smilax walteri</i>	Coral greenbrier
<i>Solanum americanum</i>	American black nightshade

Scientific Name	Common Name
<i>Solanum carolinense</i>	Carolina horsenettle
<i>Solidago canadensis</i> var. <i>scabra</i>	Canada goldenrod
<i>Solidago fistulosa</i>	Pinebarren goldenrod
<i>Solidago leavenworthii</i>	Leavenworth's goldenrod
<i>Solidago sempervirens</i>	Seaside goldenrod
<i>Solidago stricta</i>	Wand goldenrod
<i>Spartina bakeri</i>	Sand cordgrass
<i>Sphagnum</i> sp.	Peatmoss
<i>Spigelia marilandica</i>	Woodland pinkroot
<i>Spiranthes odorata</i>	Fragrant ladies'-tresses
<i>Spiranthes vernalis</i>	Spring ladies'-tresses
<i>Sporobolus floridanus</i>	Florida dropseed
<i>Sporobolus junceus</i>	Pineywoods dropseed
<i>Stachys floridana</i>	Florida betony
<i>Stenanthium densum</i>	Crowpoison
<i>Stillingia aquatica</i>	Water toothleaf
<i>Stillingia sylvatica</i>	Queen's delight
<i>Styrax americanus</i>	American snowbell
<i>Styrax grandifolius</i>	Bigleaf snowbell
<i>Symphyotrichum adnatum</i>	Scaleleaf aster
<i>Symphyotrichum carolinianum</i>	Climbing aster
<i>Symphyotrichum dumosum</i>	Rice button aster
<i>Symphyotrichum simmondsii</i>	Simmonds' aster
<i>Symplocos tinctoria</i>	Horse sugar
<i>Syngonanthus flavidulus</i>	Yellow hatpins
<i>Taxodium ascendens</i>	Pond cypress
<i>Taxodium distichum</i>	Bald cypress
<i>Tephrosia florida</i>	Florida hoary-pea
<i>Tephrosia spicata</i>	Spiked hoary-pea
<i>Thelypteris kunthii</i>	Southern shield fern
<i>Thelypteris ovata</i>	Ovate marsh fern
<i>Thelypteris palustris</i> var. <i>pubescens</i>	Marsh fern
<i>Thelypteris</i> sp.	Maiden fern
<i>Tiedemannia filiformis</i>	Water cowbane
<i>Tilia americana</i>	Basswood
<i>Tilia americana</i> var. <i>caroliniana</i>	Carolina basswood
<i>Tillandsia bartramii</i>	Bartram's air-plant
<i>Tillandsia recurvata</i>	Ballmoss
<i>Tillandsia usneoides</i>	Spanish moss

Scientific Name	Common Name
<i>Tipularia discolor</i>	Crane-fly orchid
<i>Toxicodendron radicans</i>	Eastern poison ivy
<i>Trichostema dichotomum</i>	Forked bluecurls
<i>Trillium underwoodii</i>	Longbract wakerobin
<i>Tripsacum dactyloides</i>	Eastern gamagrass
<i>Typha latifolia</i>	Broadleaf cattail
<i>Ulmus alata</i>	Winged elm
<i>Ulmus americana</i>	American elm
<i>Utricularia foliosa</i>	Leafy bladderwort
<i>Utricularia inflata</i>	Floating bladderwort
<i>Utricularia juncea</i>	Southern bladderwort
<i>Utricularia purpurea</i>	Eastern purple bladderwort
<i>Utricularia radiata</i>	Little floating bladderwort
<i>Utricularia</i> sp.	Bladderwort
<i>Utricularia subulata</i>	Zigzag bladderwort
<i>Vaccinium arboreum</i>	Sparkleberry
<i>Vaccinium corymbosum</i>	Highbush blueberry
<i>Vaccinium darrowii</i>	Darrow's blueberry
<i>Vaccinium elliotii</i>	Elliott's blueberry
<i>Vaccinium myrsinites</i>	Shiny blueberry
<i>Vaccinium stamineum</i>	Deerberry
<i>Veratrum virginicum</i>	Virginia bunchflower
<i>Verbesina virginica</i>	White crownbeard
<i>Vernonia angustifolia</i>	Tall ironweed
<i>Vernonia gigantea</i>	Giant ironweed
<i>Viburnum dentatum</i>	Southern arrowwood
<i>Viburnum nudum</i>	Possumhaw
<i>Viburnum obovatum</i>	Walter's viburnum
<i>Viburnum rufidulum</i>	Rusty blackhaw
<i>Viola lanceolata</i>	Bog white violet
<i>Viola sororia</i>	Common blue violet
<i>Vitis aestivalis</i>	Summer grape
<i>Vitis rotundifolia</i>	Muscadine
<i>Vitis vulpina</i>	Frost grape
<i>Wisteria frutescens</i>	American wisteria
<i>Woodsia obtusa</i>	Blunt-lobed cliff fern
<i>Woodwardia areolata</i>	Netted chain fern
<i>Woodwardia virginica</i>	Virginia chain fern
<i>Xyris ambigua</i>	Coastalplain yellow-eyed grass

Scientific Name	Common Name
<i>Xyris baldwiniana</i>	Baldwin's yellow-eyed grass
<i>Xyris brevifolia</i>	Shortleaf yellow-eyed grass
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass
<i>Xyris difformis</i>	Bog yellow-eyed grass
<i>Xyris elliottii</i>	Elliott's yellow-eyed grass
<i>Xyris fimbriata</i>	Fringed yellow-eyed grass
<i>Xyris flabelliformis</i>	Savannah yellow-eyed grass
<i>Xyris jupicai</i>	Richard's yellow-eyed grass
<i>Xyris platylepis</i>	Tall yellow-eyed grass
<i>Xyris</i> sp.	Yellow-eyed grass
<i>Xyris stricta</i>	Pineland yellow-eyed grass
<i>Yucca aloifolia</i>	Spanish bayonet
<i>Yucca filamentosa</i>	Adam's needle
<i>Zephyranthes atamasca</i>	Rainlily
<i>Zephyranthes treatiae</i>	Treat's zephyr-lily
<i>Zizania aquatica</i>	Annual wild rice

11.8.2 Native Wildlife Species

Amphibians	
Scientific Name	Common Name
<i>Acris gryllus</i>	Southern cricket frog
<i>Amphiuma means</i>	Two-toed amphiuma
<i>Anaxyrus terrestris</i>	Southern toad
<i>Dryophytes cinereus</i>	Green tree frog
<i>Dryophytes femoralis</i>	Pinewoods treefrog
<i>Dryophytes gratiosus</i>	Barking treefrog
<i>Dryophytes squirellus</i>	Squirrel treefrog
<i>Eurycea quadridigitata</i>	Dwarf salamander
<i>Gastrophryne carolinensis</i>	Eastern narrow-mouthed toad
<i>Hyla chrysoscelis</i>	Cope's gray treefrog
<i>Lithobates catesbeianus</i>	American bullfrog
<i>Lithobates clamitans clamitans</i>	Bronze frog
<i>Lithobates grylio</i>	Pig frog
<i>Lithobates heckscheri</i>	River frog
<i>Lithobates sphenoccephalus</i>	Southern leopard frog
<i>Notophthalmus viridescens</i>	Eastern newt
<i>Plethodon grobmani</i>	Southeastern slimy salamander
<i>Pseudacris crucifer</i>	Spring peeper

Scientific Name	Common Name
<i>Pseudacris nigrita</i>	Southern chorus frog
<i>Pseudacris ocularis</i>	Little grass frog
<i>Pseudacris ornata</i>	Ornate chorus frog
<i>Scaphiopus holbrookii</i>	Eastern spadefoot toad
<i>Siren intermedia</i>	Lesser siren

Birds

Scientific Name	Common Name
<i>Aix sponsa</i>	Wood duck
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Anhinga anhinga</i>	Anhinga
<i>Antrostomus carolinensis</i>	Chuck-will's-widow
<i>Aramus guarauna</i>	Limpkin
<i>Archilochus colubris</i>	Ruby-throated hummingbird
<i>Ardea alba</i>	Great egret
<i>Ardea herodias</i>	Great blue heron
<i>Baeolophus bicolor</i>	Tufted titmouse
<i>Bombycilla cedrorum</i>	Cedar waxwing
<i>Botaurus lentiginosus</i>	American bittern
<i>Bubo virginianus</i>	Great horned owl
<i>Bubulcus ibis</i>	Cattle egret
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo lineatus</i>	Red-shouldered hawk
<i>Buteo platypterus</i>	Broad-winged hawk
<i>Butorides virescens</i>	Green heron
<i>Cardinalis cardinalis</i>	Cardinal
<i>Catharus fuscescens</i>	Veery
<i>Catharus guttatus</i>	Hermit thrush
<i>Cathartes aura</i>	Turkey vulture
<i>Chaetura pelagica</i>	Chimney swift
<i>Charadrius vociferus</i>	Killdeer
<i>Chordeiles minor</i>	Common nighthawk
<i>Cistothorus palustris</i>	Marsh wren
<i>Cistothorus platensis</i>	Sedge wren
<i>Coccyzus americanus</i>	Yellow-billed cuckoo
<i>Colaptes auratus</i>	Northern flicker
<i>Colinus virginianus</i>	Northern bobwhite
<i>Columbina passerina</i>	Common ground-dove
<i>Contopus virens</i>	Eastern wood-peewee

Scientific Name	Common Name
<i>Coragyps atratus</i>	Black vulture
<i>Corthylio calendula</i>	Ruby-crowned kinglet
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus ossifragus</i>	Fish crow
<i>Cyanocitta cristata</i>	Blue jay
<i>Dolichonyx oryzivorus</i>	Bobolink
<i>Dryobates pubescens</i>	Downy woodpecker
<i>Dryocopus pileatus</i>	Pileated woodpecker
<i>Dumetella carolinensis</i>	Gray catbird
<i>Egretta caerulea</i>	Little blue heron
<i>Egretta thula</i>	Snowy egret
<i>Egretta tricolor</i>	Tricolored heron
<i>Elanoides forficatus</i>	Swallow-tailed kite
<i>Empidonax virescens</i>	Acadian flycatcher
<i>Eudocimus albus</i>	White ibis
<i>Falco sparverius</i>	American kestrel
<i>Fulica americana</i>	American coot
<i>Gallinula galeata</i>	Common gallinule
<i>Geothlypis formosa</i>	Kentucky warbler
<i>Geothlypis trichas</i>	Common yellowthroat
<i>Haliaeetus leucocephalus</i>	Bald eagle
<i>Hirundo rustica</i>	Barn swallow
<i>Hylocichla mustelina</i>	Wood thrush
<i>Icteria virens</i>	Yellow-breasted chat
<i>Ictinia mississippiensis</i>	Mississippi kite
<i>Ixobrychus exilis</i>	Least bittern
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Limnothlypis swainsonii</i>	Swainson's warbler
<i>Lophodytes cucullatus</i>	Hooded merganser
<i>Mareca americana</i>	American wigeon
<i>Megaceryle alcyon</i>	Belted kingfisher
<i>Megascops asio</i>	Eastern screech owl
<i>Melanerpes carolinus</i>	Red-bellied woodpecker
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker
<i>Meleagris gallopavo</i>	Wild turkey
<i>Melospiza georgiana</i>	Swamp sparrow
<i>Melospiza melodia</i>	Song sparrow
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Mniotilta varia</i>	Black-and-white warbler

Scientific Name	Common Name
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Mycteria americana</i>	Wood stork
<i>Myiarchus crinitus</i>	Great crested flycatcher
<i>Nyctanassa violacea</i>	Yellow-crowned night heron
<i>Nycticorax nycticorax</i>	Black-crowned night heron
<i>Pandion haliaetus</i>	Osprey
<i>Parkesia noveboracensis</i>	Northern waterthrush
<i>Passerina caerulea</i>	Blue grosbeak
<i>Passerina cyanea</i>	Indigo bunting
<i>Peucaea aestivalis</i>	Bachman's sparrow
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<i>Pipilo erythrophthalmus</i>	Eastern towhee
<i>Piranga rubra</i>	Summer tanager
<i>Podilymbus podiceps</i>	Pied-billed grebe
<i>Poecile carolinensis</i>	Carolina chickadee
<i>Poliophtila caerulea</i>	Blue-gray gnatcatcher
<i>Porphyrio martinicus</i>	Purple gallinule
<i>Porzana carolina</i>	Sora
<i>Progne subis</i>	Purple martin
<i>Protonotaria citrea</i>	Prothonotary warbler
<i>Quiscalus quiscula</i>	Common grackle
<i>Regulus satrapa</i>	Golden-crowned kinglet
<i>Sayornis phoebe</i>	Eastern phoebe
<i>Scolopax minor</i>	American woodcock
<i>Setophaga americana</i>	Northern parula
<i>Setophaga citrina</i>	Hooded warbler
<i>Setophaga coronata</i>	Yellow-rumped warbler
<i>Setophaga discolor</i>	Prairie warbler
<i>Setophaga dominica</i>	Yellow-throated warbler
<i>Setophaga palmarum</i>	Palm warbler
<i>Setophaga pinus</i>	Pine warbler
<i>Setophaga ruticilla</i>	American redstart
<i>Sialia sialis</i>	Eastern bluebird
<i>Sitta pusilla</i>	Brown-headed nuthatch
<i>Spatula discors</i>	Blue-winged teal
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker
<i>Spinus tristis</i>	American goldfinch
<i>Spizella passerina</i>	Chipping sparrow

Scientific Name	Common Name
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Strix varia</i>	Barred owl
<i>Tachycineta bicolor</i>	Tree swallow
<i>Thryothorus ludovicianus</i>	Carolina wren
<i>Toxostoma rufum</i>	Brown thrasher
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Tringa solitaria</i>	Solitary sandpiper
<i>Troglodytes aedon</i>	House wren
<i>Troglodytes hiemalis</i>	Winter wren
<i>Turdus migratorius</i>	American robin
<i>Tyrannus tyrannus</i>	Eastern kingbird
<i>Vireo flavifrons</i>	Yellow-throated vireo
<i>Vireo griseus</i>	White-eyed vireo
<i>Vireo olivaceus</i>	Red-eyed vireo
<i>Vireo solitarius</i>	Blue-headed vireo
<i>Zenaida macroura</i>	Mourning dove

Mammals

Scientific Name	Common Name
<i>Blarina carolinensis</i>	Southern short-tailed shrew
<i>Canis latrans</i>	Coyote
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat
<i>Dasypus novemcinctus</i>	Nine-banded armadillo
<i>Didelphis virginiana</i>	Virginia opossum
<i>Eptesicus fuscus</i>	Big brown bat
<i>Glaucomys volans</i>	Southern flying squirrel
<i>Lasiurus borealis</i>	Eastern red bat
<i>Lasiurus intermedius</i>	Northern yellow bat
<i>Lasiurus seminolus</i>	Seminole bat
<i>Lontra canadensis</i>	North American river otter
<i>Lynx rufus</i>	Bobcat
<i>Myotis austroriparius</i>	Southeastern myotis
<i>Nycticeius humeralis</i>	Evening bat
<i>Odocoileus virginianus</i>	White-tailed deer
<i>Perimyotis subflavus</i>	Tri-colored bat
<i>Peromyscus gossypinus</i>	Cotton mouse
<i>Procyon lotor</i>	Raccoon
<i>Sciurus carolinensis</i>	Eastern gray squirrel
<i>Sigmodon hispidus</i>	Hispid cotton rat

Scientific Name	Common Name
<i>Sorex longirostris</i>	Southeastern shrew
<i>Sylvilagus palustris</i>	Marsh rabbit
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat
<i>Urocyon cinereoargenteus</i>	Gray fox
<i>Ursus americanus</i>	Black bear

Reptiles

Scientific Name	Common Name
<i>Agkistrodon conanti</i>	Florida cottonmouth
<i>Alligator mississippiensis</i>	American alligator
<i>Anolis carolinensis</i>	Green anole
<i>Aspidoscelis sexlineatus</i>	Six-lined racerunner
<i>Cemophora coccinea</i>	Scarlet snake
<i>Chelydra serpentina</i>	Common snapping turtle
<i>Coluber constrictor priapus</i>	Southern black racer
<i>Crotalus adamanteus</i>	Eastern diamondback rattlesnake
<i>Diadophis punctatus punctatus</i>	Southern ring-necked snake
<i>Farancia abacura</i>	Eastern mudsnake
<i>Gopherus polyphemus</i>	Gopher tortoise
<i>Graptemys barbouri</i>	Barbour's map turtle
<i>Heterodon platirhinos</i>	Eastern hognose snake
<i>Kinosternon subrubrum</i>	Eastern mud turtle
<i>Lampropeltis elapsoides</i>	Scarlet kingsnake
<i>Lampropeltis getula</i>	Eastern kingsnake
<i>Liodytes rigida</i>	Glossy swampsnake
<i>Macrochelys temminckii</i>	Alligator snapping turtle
<i>Micrurus fulvius</i>	Eastern coral snake
<i>Nerodia fasciata</i>	Banded watersnake
<i>Opheodrys aestivus</i>	Rough green snake
<i>Ophisaurus ventralis</i>	Eastern glass lizard
<i>Pantherophis guttatus</i>	Red ratsnake
<i>Pantherophis spiloides</i>	Gray ratsnake
<i>Plesiodon fasciatus</i>	Five-lined skink
<i>Plestiodon inexpectatus</i>	Southeastern five-lined skink
<i>Plestiodon laticeps</i>	Broad-headed skink
<i>Pseudemys concinna</i>	River cooter
<i>Sceloporus undulatus</i>	Eastern fence lizard
<i>Scincella lateralis</i>	Little brown skink
<i>Sistrurus miliarius</i>	Pygmy rattlesnake

Scientific Name	Common Name
<i>Sternotherus minor</i>	Loggerhead musk turtle
<i>Sternotherus odoratus</i>	Common musk turtle
<i>Storeria dekayi</i>	Dekay's snake
<i>Storeria occipitomaculata</i>	Red-bellied snake
<i>Terrapene carolina</i>	Box turtle
<i>Thamnophis saurita</i>	Eastern ribbon snake
<i>Thamnophis sirtalis</i>	Common gartersnake
<i>Trachemys scripta</i>	Yellow-bellied slider

Fish

Scientific Name	Common Name
<i>Enneacanthus gloriosus</i>	Bluespotted sunfish
<i>Esox americanus</i>	American pickerel
<i>Gambusia holbrooki</i>	Eastern mosquitofish
<i>Heterandria formosa</i>	Least killifish
<i>Lepomis gulosus</i>	Warmouth
<i>Leptolucania ommata</i>	Pygmy killifish
<i>Micropterus nigricans</i>	Largemouth bass

Arthropods

Scientific Name	Common Name
<i>Acanthocephala terminalis</i>	Leaf-footed bug sp.
<i>Anartia jatrophae</i>	White peacock
<i>Chicobolus spinigerus</i>	Ivory millipede
<i>Erynnis horatius</i>	Horace's duskywing
<i>Erythemis simplicicollis</i>	Eastern pondhawk
<i>Hagenius brevistylus</i>	Dragonhunter
<i>Hermeuptychia sosybius</i>	Carolina satyr
<i>Hyphantria cunea</i>	Fall webworm moth
<i>Libellula vibrans</i>	Great blue skimmer
<i>Macromia illinoensis</i>	Swift river cruiser
<i>Phyciodes phaon</i>	Phaon crescent
<i>Phyciodes tharos</i>	Pearl crescent
<i>Romalea microptera</i>	Eastern lubber grasshopper
<i>Satyrium favonius</i>	Southern hairstreak
<i>Strangalia luteicornis</i>	Flower longhorn beetle

11.9 Imperiled Plant Descriptions

Pine-Woods Bluestem (*Andropogon arctatus*) - Pine-woods bluestem, state Threatened, is a perennial, tufted grass that prefers mesic to wet flatwoods, wet prairie, and seepage bog with open, wiregrass-dominated areas with widely spaced pines. This species needs a fire regime that includes frequent (two to three years) growing season fires that reduce the encroachment of woody species and creates open areas allowing sunlight to reach the ground. Pine-woods bluestem also requires fire for flower production, and it will produce flowers for up to one to two years after a fire. However, without fire this species will remain in a vegetative state. Soil and hydrologic disturbance negatively affect this species; therefore, maintain and restore the natural hydrology and limit the use of heavy machinery in this species' habitats. Flowering, which occurs primarily from September to November, are the best times for conducting surveys or verifying species identity, and since the best flowering is after a fire, conduct surveys within a year of fire.

Southern Lady Fern (*Athyrium filix-femina*) - Southern lady fern is a deciduous, medium-sized, understory fern that prefers partially shaded to shaded areas in upland hardwood forest, slope forest, and seepage stream. This species is sensitive to fire, but some of its preferred habitats occasionally burn during periods of drought. Hydrological disturbances and habitat alteration negatively affect this species; therefore, maintain and restore the natural hydrology where it is practicable and protect known areas with known occurrences. The best time for conducting surveys or verifying species identity is when fronds are present, which occurs from March to November.

Chapman's Sedge (*Carex chapmannii*) - Chapman's sedge is a perennial sedge that forms small to large tufts. This species prefers areas in hammock woodlands, sandy hammock (beech-magnolia-maple with some oak-pine), and floodplains of blackwater stream with intermittent floods of brief duration. Chapman's sedge does not require fire but allow fire to naturally enter and extinguish within its habitats when feasible. Soil and hydrologic disturbance negatively affect this species; therefore, maintain and restore the natural hydrology and limit the use of heavy machinery in this species' habitats. Flowering, which occurs from March to April, or fruiting, which occurs primarily in May, are the best times for conducting surveys or verifying species identity.

Sand Butterfly Pea (*Centrosema arenicola*) - Sand butterfly pea, endemic to Florida, is a twining and climbing herbaceous perennial vine that produces resupinate (inverted) flowers. This species prefers open areas in sandhill, scrubby flatwoods, and upland mixed woodland. Sand butterfly pea may occur in ecotones, firebreaks, powerline rights-of-way, and along roadsides or trails within its preferred habitats. Sand butterfly pea requires a fire regime that reduces the encroachment of woody species and creates or maintains open areas. This species is well-adapted to growing season fire and responds to fire by vigorously flowering and re-sprouting and has increased seedling establishment. Altered fire regimes and fire suppression negatively affect this species, therefore, prescribed fire should follow appropriate natural community fire regimes and vary by season, frequency, and fire intensity to ensure species diversity. Flowering, which occurs from June to October, is the best time for conducting surveys or verifying species identity.

Spreading Pogonia (*Cleistes divaricata*) - Spreading pogonia is a perennial, terrestrial orchid that prefers sunny openings in bog, meadows, prairies, wet woods, wet flatwoods, pine savannas, and cypress swamps with acidic soils. This species may also occur along stream banks and wet roadside ditches. This species needs a fire regime that includes frequent (two to three years) growing season fires that reduce the encroachment of woody species and that creates open areas allowing sunlight to reach the ground. Soil and hydrologic disturbances negatively affect this species; therefore, maintain and restore the natural hydrology and avoid using heavy machinery in wetlands. Flowering, which occurs primarily from April to June, is the best time for conducting surveys or verifying species identity.

Green-Fly Orchid (*Epidendrum conopseum*) – Green-fly orchid is an epiphytic orchid that grows on many different trees and prefers moist to wet areas in basin swamp, bottomland forest, depression marsh, maritime hammock, sinkhole, and upland hardwood forest. It may occur in dome swamp, floodplain swamp, hydric hammock, and mesic hammock. This species does not require fire but allows fire to naturally enter and extinguish within its habitats when feasible. Illegal collecting and hydrological disturbances negatively affect this species; therefore, protect areas with known occurrences and maintain and restore the natural hydrology where practicable. Flowering, which occurs from June to October, or fruiting, which occurs from September to January, are the best times for conducting surveys or verifying species identity.

Heartleaf Wild Ginger (*Hexastylis arifolia*) - Heartleaf wild ginger is an aromatic, perennial, evergreen herb that prefers full or partially shaded areas in slope forest and upland hardwood forest. This species does not require fire, but its preferred habitats occasionally burn when fires creep into the forest edges from surrounding pyrogenic communities. Soil disturbances negatively affect this species; therefore, limit the impact of disruptive activities near documented occurrences. Flowering, which occurs from late March to May, is the best time for conducting surveys or verifying species identity.

Corkwood (*Leitneria floridana*) - Corkwood is a clonal deciduous shrub or small tree that prefers open or forested areas with either fresh or coastally influenced brackish wet soils in swamp, marsh, wetlands, rivers and streams, and other low, poorly-drained areas. This species does not require fire, and it typically prefers non-pyrogenic habitats, which occasionally burn during periods of drought. However, after a fire, corkwood resprouts vigorously and will return to its original height in about three months. Hydrologic disturbances negatively affect this species; therefore, protect wetlands from draining and maintain natural hydrology. Corkwood is identifiable throughout the year by its corky bark, leaf scars, and overall wand-like appearance, and surveys for flowers can occur from March to August.

Catesby Lily (*Lilium catesbaei*) - Catesby lily, also known as pine lily, is a perennial herb and is the largest of any North American lily. This species prefers open areas in wet pine flatwoods and wet prairie, especially in pitcherplant bog with sphagnum. Unlike most lily species, Catesby lilies require warm, moist, acidic soil and will grow in saturated soil conditions. This species requires a fire regime that includes frequent (two to three year) fire to maintain and promote the open grassy habitats that it favors, with most fire occurring during the growing season. This species thrives

with disturbance from fire demonstrating a more vigorous flowering. Soil and hydrologic disturbances negatively affect this species; therefore, limit the impact of disruptive activities and maintain and restore the natural hydrology where practicable. Flowering, which occurs from August to November, is the best time for conducting surveys or verifying species identity.

Southern Twayblade (*Listera australis*) - Southern twayblade is a small, terrestrial orchid that prefers partially shaded to sunny areas in bottomland forest, baygall, mesic and wet flatwoods, ravines, banks of streams, hydric hammock, and upland hardwood forest. Botanists have not studied this species' fire ecology. However, this species occurs in mesic and wet flatwoods, which require frequent fire. Soil and hydrologic disturbance negatively affect this species; therefore, maintain and restore the natural hydrology where practicable and limit disruptive activities near documented occurrences. The best time for conducting surveys or verifying species identity is during flowering, which occurs from January to May.

Cardinal Flower (*Lobelia cardinalis*) - Cardinal flower is a milky, sapped, tall, perennial herb with large, brilliant red, two-lipped flowers on a tall stem. Few native plants have flowers of such intense color as cardinal flower, so it is easily recognized at considerable distance when in bloom in the summer. This species prefers sunny areas near sources of water in bottomland forest, dome swamp, hydric hammock, floodplain swamp, and spring run streams. Cardinal flower is sensitive to fire and typically prefers non-pyrogenic habitats, which occasionally burn during periods of drought. Soil and hydrologic disturbance negatively affect this species; therefore, maintain and restore the natural hydrology where practicable and avoid using heavy machinery in wetlands with known occurrences of these species. Flowering, which primarily occurs from July to September, is the best time for conducting surveys or verifying species identity.

Crabapple (*Malus angustifolia*) – Crabapple is a small, deciduous tree with spreading branches and a broad open canopy, and it commonly forms thickets from suckers sprouting from its roots. This species prefers areas in mesic flatwoods, mesic hammock, sandhill, scrubby flatwoods, upland mixed woodland, and upland pine. While crabapple does not require fire for its survival, most of its preferred habitats require periodic fires that reduce overstory competition. If crabapple is top killed by fire, it survives by resprouting from its roots. Altered fire regimes and fire suppression negatively affect this species' preferred habitats, therefore, prescribed fire intervals should vary by season, frequency, and fire intensity. This species is considered important to wildlife as both food (the fruit and as browse), and as cover (when it grows as a thicket). Flowering, which occurs primarily from February to May, or fruiting, which occurs from August to September, are the best times for conducting surveys.

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 mounds, 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 fruiting occurs 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 FWC typically does not actively manage, if conducting management activities near known occurrences, 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. As fronds are present year-round, these species can be identified throughout the year.

Blue-Flowered Butterwort (*Pinguicula caerulea*) - Blue-flowered butterwort is a perennial, carnivorous herb that spends much of its life cycle as a basal rosette. This species prefers open, moist to wet, sandy-peaty soils of pine flatwoods, wet prairie, and seepage bog. Blue-flowered butterwort may occupy moist to wet ditches and roadsides. This species needs a fire regime that includes frequent (two to three years) growing season fires that reduce the encroachment of woody species and create open areas allowing sunlight to reach the ground. Soil and hydrologic disturbances negatively affect this species; therefore, maintain and restore the natural hydrology and avoid using heavy machinery in wetlands. Flowering, which occurs primarily from February to April, is the best time for conducting surveys or verifying species identity.

Chapman's Fringed Orchid (*Platanthera chapmanii*) - Chapman's fringed orchid is a terrestrial, perennial orchid that prefers full or partial sun and moist to wet, acidic soils in mesic flatwoods, seepage slope, wet flatwoods, and wet prairie. It also occurs in hillside seeps and along wet roadsides. The specific fire requirements are unknown for this species. However, since it prefers full or partial sun, a fire regime in flatwoods and prairie that includes frequent (two to three years) growing season fires that reduce the encroachment of woody species will be beneficial for this species. Soil and hydrologic disturbance negatively affect this species; therefore, maintain and restore the natural hydrology where practicable and avoid using heavy machinery in wetlands with known occurrences of these species. Flowering, which occurs primarily from July to September, is the best time for conducting surveys or verifying species identity. Because flowering in this species is highly erratic from year to year, populations may be persisting even if not seen.

Palegreen Orchid (*Platanthera flava*) - Palegreen orchid is a terrestrial, perennial orchid that prefers full or partial sun and wet to moist, slightly acidic to slightly alkaline soils in alluvial forest, basin swamp, bottomland forest, floodplain swamp, hydric hammock, mesic flatwoods, wet flatwoods, and wet prairie. This species may also occur on peaty or sandy soils along the margins of lakes, rivers, and ponds. The specific fire requirements are unknown for this species. However, since it prefers full or partial sun, a fire regime in flatwoods and prairie that includes frequent (two to three years) growing season fires that reduce the encroachment of woody species will be beneficial for this species. Because flowering in this species is highly erratic from year to year, populations may be persisting even if not seen. Soil and hydrological disturbances negatively affect this species; therefore, maintain and restore the natural hydrology and avoid using heavy machinery in wetlands. Flowering, which occurs primarily from late June to early 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 hardwood forest. Even though this species is not fire-tolerant, allow fire to naturally enter and extinguish within its habitats when feasible. Illegal collecting and habitat alteration negatively affect this species; therefore, protect known occurrences and make sure not to negatively influence areas with known occurrences. Surveys or species identification may occur throughout the year for this species.

Pink Azalea (*Rhododendron canescens*) - Pink azalea is a deciduous, multi-trunked shrub or small tree that prefers moist areas in hydric hammock, mesic flatwoods, seepage slope, upland pine forest, and wet flatwoods. This species does not require fire. However, some of its preferred habitats are fire-adapted, and this species may re-sprout after light fires. Illegal collecting and hydrological disturbances negatively affect this species; therefore, protect areas with known occurrences and maintain and restore the natural hydrology where practicable. The best time for conducting surveys or verifying species identity is during flowering, which occurs from March to May.

Florida Willow (*Salix floridana*) - Florida willow is a dioecious, deciduous tree or shrub that prefers very wet, calcareous soils in floodplain swamp, hydric hammock, and spring run streams. Florida willow, like other willow species, is thin-barked. As such, this species typically prefers non-pyrogenic habitats which may occasionally burn during periods of drought. However, it may resprout after a fire if water levels are high enough during the fire to protect a portion of the trunk. Soil and hydrologic disturbances negatively affect this species; therefore, maintain and restore the natural hydrology and avoid using heavy machinery in wetlands. Flowering, which occurs from April to May, is the best time for conducting surveys or verifying species' identity.

Hooded Pitcherplant (*Sarracenia minor*) and Parrot Pitcherplant (*S. psittacine*)- Pitcherplants are perennial, carnivorous herbs forming dense clumps that prefer sunny to lightly shaded areas and moist to wet, sandy, acidic soils in basin swamp, depression marsh, dome swamp, dry prairie, mesic flatwoods, wet flatwoods, wet prairie, shrub bog, seepage slope, and edges of seepage streams. Pitcherplants may also occur on boggy roadsides and ditches. They need a fire regime

that includes frequent (two to three years) growing season fires that reduce the encroachment of woody species. Pitcherplants are usually top killed by fire, but they survive by resprouting from rhizomes. Soil and hydrologic disturbances negatively affect this species; therefore, avoid activities that alter hydrology and damage soils. Pitcherplants are identifiable all year, and surveys for flowers can occur from March to June.

Saw Palmetto (*Serenoa repens*) - Saw palmetto is a small, fan palm that grows in clumps or dense thickets in many natural communities in Florida, both wet and dry. This species does not require fire for its survival. However, many of its preferred communities require periodic or frequent fire. Most fires defoliate and top kill saw palmetto, but it resprouts soon after a fire. Illegal collecting of saw palmetto berries negatively affects this species; therefore, take precautions to protect berries from harvest. Saw palmetto is identifiable throughout the year.

Crane-Fly Orchid (*Tipularia discolor*) - Crane-fly orchid is a small, terrestrial orchid that prefers shaded, moist areas in upland hardwood forest, upland mixed woodland, hammocks, and ravine forest. The specific fire requirements are unknown for this species. However, this species occurs in upland mixed woodland, which requires periodic fire. Habitat degradation and invasive species negatively affect this species; therefore, protect this species' habitat from alteration and treat non-native plant infestations, taking extra precautions to protect this species during herbicide treatments. Flowering, which occurs from late June to September, is the best time for conducting surveys or verifying species identity.

Rainlily (*Zephyranthes atamasca*) - Rainlily is a perennial herb that prefers closed canopied bottomland forest, hydric hammock, mesic hammock, upland hardwood forest, and upland mixed forest. This species does not require fire; however, it vigorously flowers following fires. Hydrological disturbances, illegal collecting, and fire suppression in flatwoods negatively affect this species; therefore, restore the natural hydrology where practicable, protect areas with known occurrences, and conduct prescribed fire within flatwoods with a frequency that will create or maintain open areas, limit the shrub layer, and encourage diverse herbaceous cover. Flowering, which occurs from January-May, the best time for conducting surveys or verifying species identity.

Treat's Zephyr-Lily (*Zephyranthes treatiae*) - Treat's zephyr-lily is a perennial herb that prefers open-canopied mesic and wet flatwoods. However, this species may occur in bottomland forest, hydric hammock, mesic hammock, upland hardwood forest, upland mixed forest, and wet prairie. This species does not require fire. However, it vigorously flowers following fires. Hydrological disturbances, illegal collecting, and fire suppression in flatwoods negatively affect this species; therefore, maintain and restore the natural hydrology where practicable, protect areas with known occurrences, and conduct prescribed fire within flatwoods with a frequency that will create or maintain open areas, limit the shrub layer, and encourage diverse herbaceous cover. Flowering, which occurs from January to April usually following rain, the best time for conducting surveys or verifying species identity.

11.10 FNAI Element Occurrence Data Usage Letter



1018 Thomasville Road
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850-224-8207
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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.



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Sincerely,

Frank Price
Assistant Director
Florida Natural Areas Inventory

Tracking Florida's Biodiversity

11.11 FNAI Natural Inventory Ranking System 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).
- GNRTR** = 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).

11.12 Cultural Resources

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE00013	Archaeological site	Coon Bottom	1.05	N/A
JE00018	Archaeological site	N/A	10.22	N/A
JE00019	Archaeological site	N/A	35.59	N/A
JE00020	Archaeological site	N/A	45.30	N/A
JE00021	Archaeological site	N/A	40.94	N/A
JE00022	Archaeological site	N/A	10.49	N/A
JE00023	Archaeological site	N/A	36.67	N/A
JE00024	Archaeological site	N/A	68.20	N/A
JE00025	Archaeological site	N/A	44.20	N/A
JE00026	Archaeological site	N/A	31.82	N/A
JE00027	Archaeological site	N/A	25.31	N/A
JE00028	Archaeological site	N/A	9.07	N/A
JE00029	Archaeological site	N/A	9.63	N/A
JE00030	Archaeological site	N/A	10.49	N/A
JE00031	Archaeological site	N/A	10.54	N/A
JE00032	Archaeological site	N/A	20.93	N/A
JE00033	Archaeological site	N/A	36.57	N/A
JE00034	Archaeological site	N/A	36.67	N/A
JE00035	Archaeological site	N/A	36.67	N/A
JE00036	Archaeological site	N/A	47.50	N/A
JE00037	Archaeological site	N/A	9.14	N/A
JE00038	Archaeological site	N/A	11.07	N/A
JE00039	Archaeological site	N/A	7.97	N/A
JE00040	Archaeological site	N/A	16.41	N/A
JE00041	Archaeological site	N/A	81.44	N/A
JE00042	Archaeological site	N/A	17.54	N/A
JE00043	Archaeological site	N/A	16.40	N/A
JE00044	Archaeological site	N/A	32.43	N/A
JE00049	Archaeological site	N/A	47.52	N/A
JE00050	Archaeological site	N/A	61.84	N/A
JE00051	Archaeological site	N/A	43.82	N/A
JE00055	Archaeological site	N/A	78.48	N/A
JE00063	Archaeological site	Camp Pleasant BM	0.67	N/A
JE00084	Archaeological site	Hog	20.57	N/A
JE00156	Archaeological site	Goose Pasture	2.87	N/A
JE00163	Archaeological site	Post Office Camp	1.18	N/A
JE00164	Archaeological site	Strauss Mound	1.10	N/A
JE00165	Archaeological site	Walker Mound	1.06	N/A
JE00166	Archaeological site	Hagan Mound	1.12	N/A
JE00167	Archaeological site	McClusky Mound Stand	1.54	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE00168	Archaeological site	Monroe Mound	0.90	N/A
JE00169	Archaeological site	Liquor Still Camp	0.39	N/A
JE00170	Archaeological site	Albritton Mound	0.86	N/A
JE00171	Archaeological site	Little Don Mound	0.72	N/A
JE00173	Archaeological site	Little Jack Mound	1.30	N/A
JE00174	Archaeological site	Jug Island Mound	1.48	N/A
JE00175	Archaeological site	Cochran Mound	2.40	N/A
JE00177	Archaeological site	Pender Camp	1.30	N/A
JE00178	Archaeological site	Malloy's Mound	1.71	N/A
JE00179	Archaeological site	Bear Grass Mound	1.31	N/A
JE00180	Archaeological site	Girardeau's Camp	8.67	N/A
JE00181	Archaeological site	Cedar Hammock	15.20	N/A
JE00182	Archaeological site	Lewis Camp Mound	1.73	N/A
JE00183	Archaeological site	Burnt Out Mounds	5.86	N/A
JE00184	Archaeological site	Cedar Island	1.01	N/A
JE00185	Archaeological site	Oak Mound Stand	1.55	N/A
JE00186	Archaeological site	Calico Hill Mounds	32.15	N/A
JE00187	Archaeological site	Douglas Mound and Village	2.22	N/A
JE00188	Archaeological site	Clemons Mound and Village	1.60	N/A
JE00189	Archaeological site	Georges Mound	1.55	N/A
JE00197	Archaeological site	Old Tram	8.21	N/A
JE00259	Archaeological site	Diver	38.54	N/A
JE00566	Archaeological site	N/A	0.41	N/A
JE00571	Archaeological site	Wacissa Workshop 1	0.36	N/A
JE00601	Archaeological site	Eva Wast	3.22	N/A
JE00612	Archaeological site	2 1/2 Fathom Quarry	0.47	N/A
JE00613	Archaeological site	Consolidated Mastodon	0.37	N/A
JE00614	Archaeological site	Wacissa 10	0.40	N/A
JE00615	Archaeological site	River Bend Quarry	0.36	N/A
JE00616	Archaeological site	Wacissa 11	0.34	N/A
JE00617	Archaeological site	Wacissa 12	0.35	N/A
JE00618	Archaeological site	Wacissa 13	0.25	N/A
JE00619	Archaeological site	Wacissa 14	0.37	N/A
JE00620	Archaeological site	Long Bone	0.46	N/A
JE00701	Archaeological site	Wacissa	7.38	N/A
JE00702	Archaeological site	Kidd's Tree	41.13	N/A
JE00704	Archaeological site	Debbie II	3.58	N/A
JE00705	Archaeological site	Debbie #3	0.77	N/A
JE00706	Archaeological site	Debbie #4	1.35	N/A
JE00707	Archaeological site	Charly's Pride	6.27	N/A
JE00708	Archaeological site	Doughnut	2.91	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE00709	Archaeological site	Cow Creek	18.95	N/A
JE00714	Archaeological site	West Head 2	0.91	N/A
JE00715	Archaeological site	Denowl 3	0.93	N/A
JE00722	Archaeological site	Hunting Shack 1	1.12	N/A
JE00723	Archaeological site	Hunting Shack 2	9.08	N/A
JE00724	Archaeological site	Hunting Shack 3	0.73	N/A
JE00725	Archaeological site	Dumpster 1	0.81	N/A
JE00726	Archaeological site	Dumpster 2	0.93	N/A
JE00727	Archaeological site	Dumpster 3	0.76	N/A
JE00736	Archaeological site	Denowl 2	0.63	N/A
JE00742	Archaeological site	Wacissa Cave	0.76	N/A
JE00761	Archaeological site	Pete's Place	0.44	N/A
JE00780	Archaeological site	Pete's Place Too	0.95	N/A
JE00801	Archaeological site	Wacissa River Calico Hill	0.56	N/A
JE00802	Archaeological site	Wacissa River Midden	1.56	N/A
JE00851	Archaeological site	Hosford Branch Quarry	20.48	N/A
JE00927	Archaeological site	St Joe #7 Whiskey Springs	0.90	N/A
JE00928	Archaeological site	St Joe Mound #1 Midden Type	0.93	N/A
JE00929	Archaeological site	St Joe Mound #2	0.60	N/A
JE00930	Archaeological site	St Joe Mound #3	0.55	N/A
JE00931	Archaeological site	St Joe Mound #4 Burial – Human Remains	0.73	N/A
JE00932	Archaeological site	St Joe Mound #5 Village/Habitation/Activ	3.66	N/A
JE00933	Archaeological site	St Joe Mound #6 Mound	0.61	N/A
JE00934	Archaeological site	Flattened Mound	0.05	N/A
JE00935	Archaeological site	Welaunee Creek Mound	0.08	N/A
JE00936	Archaeological site	Giant Cypress Mound	0.08	N/A
JE00937	Archaeological site	Center Trench Mound	0.01	N/A
JE00938	Archaeological site	Robert's Attention	0.25	N/A
JE00939	Archaeological site	Moonshine Mound	1.53	N/A
JE00940	Archaeological site	I Don't Know	0.04	N/A
JE00941	Archaeological site	Armadillo Sink	2.03	N/A
JE00942	Archaeological site	Fool's Cabin	0.03	N/A
JE00943	Archaeological site	Thirty Percent Mound	0.03	N/A
JE00944	Archaeological site	Rapids Mound	0.12	N/A
JE00945	Archaeological site	Road's Mound	0.01	N/A
JE00946	Archaeological site	Blue Bucket Mound	0.03	N/A
JE00947	Archaeological site	Fern Mound	0.03	N/A
JE00948	Archaeological site	Swaying Palms	0.12	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE00949	Archaeological site	Four Blaze Mound	0.02	N/A
JE00950	Archaeological site	Fossil Shell Mound	0.03	N/A
JE00951	Archaeological site	Mountain Mound	0.08	N/A
JE00952	Archaeological site	Hunt Camp	0.23	N/A
JE00954	Archaeological site	Alice	0.08	N/A
JE00955	Archaeological site	Big Tool	0.03	N/A
JE00956	Archaeological site	Chief Mound	0.15	N/A
JE00957	Archaeological site	Divide Mound	0.04	N/A
JE00958	Archaeological site	Every Mound	0.03	N/A
JE00959	Archaeological site	Frog Rock Mound	0.03	N/A
JE00960	Archaeological site	Grant's Mound	0.05	N/A
JE00961	Archaeological site	Hidden Mound	0.05	N/A
JE00962	Archaeological site	It's a Big Oak	0.08	N/A
JE00963	Archaeological site	Jr. Stella	0.04	N/A
JE00964	Archaeological site	Kicked Dirt Mound	0.02	N/A
JE00965	Archaeological site	Lost Oyster Mound	0.02	N/A
JE00966	Archaeological site	Mossy Massive Oak	0.00	N/A
JE00967	Archaeological site	Not Looted Mound	0.02	N/A
JE00968	Archaeological site	Oh Man Mound	0.06	N/A
JE00969	Archaeological site	Possum Mound	0.03	N/A
JE00970	Archaeological site	Questionable Mound	0.01	N/A
JE00971	Archaeological site	Rimsherd Mound	0.06	N/A
JE00972	Archaeological site	Skidder Mound	0.02	N/A
JE00973	Archaeological site	Singing Otter Mound	0.17	N/A
JE00974	Archaeological site	Caw Mound	0.21	N/A
JE00975	Archaeological site	Double Caw Mound	0.05	N/A
JE00976	Archaeological site	Volcano	3.61	N/A
JE00977	Archaeological site	The Last Caw	0.04	N/A
JE00978	Archaeological site	Stuck in the Mud	0.05	N/A
JE00979	Archaeological site	Giant Antler Mound	0.14	N/A
JE00980	Archaeological site	Possum's Lawnchair	0.04	N/A
JE00981	Archaeological site	Fleeing Deer Mound	0.07	N/A
JE00982	Archaeological site	Screeching Hawk Mound	0.15	N/A
JE00983	Archaeological site	Fenceline Mound	0.03	N/A
JE00984	Archaeological site	Wet Socks Mound	0.03	N/A
JE00985	Archaeological site	One Cabbage	0.02	N/A
JE00986	Archaeological site	Little Ridge	0.67	N/A
JE00987	Archaeological site	Dupree Mound	0.06	N/A
JE00988	Archaeological site	Palmolia	0.08	N/A
JE00989	Archaeological site	Stumble	0.01	N/A
JE00990	Archaeological site	Mound in Bloom	0.02	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE00991	Archaeological site	Monster Oak	0.01	N/A
JE00992	Archaeological site	Bill's Mound	0.07	N/A
JE00993	Archaeological site	Green Bucket Mound	0.20	N/A
JE00994	Archaeological site	Muscadine Mound	0.02	N/A
JE00995	Archaeological site	Blooming Thistle Mound	5.78	N/A
JE00996	Archaeological site	Tree Fall Mound	0.01	N/A
JE00997	Archaeological site	Pock Marked Mound	0.04	N/A
JE00998	Archaeological site	Boggin' Julie Mound	0.14	N/A
JE00999	Archaeological site	Turtle Egg	0.04	N/A
JE01000	Archaeological site	Gator Tail Mound	0.06	N/A
JE01001	Archaeological site	Snail Shell	0.10	N/A
JE01002	Archaeological site	Park Mound	0.07	N/A
JE01003	Archaeological site	Two Creeks Mound	0.06	N/A
JE01004	Archaeological site	Ryan-Harley	52.97	N/A
JE01005	Archaeological site	Rapids Ridge Mound	0.18	N/A
JE01006	Archaeological site	Mailbox Mound	0.05	N/A
JE01007	Archaeological site	Rock Camp Mound	0.02	N/A
JE01008	Archaeological site	Box Turtle's Tallboy	0.09	N/A
JE01009	Archaeological site	Engraving Mound	0.12	N/A
JE01010	Archaeological site	Runkle Reduction	1.11	N/A
JE01011	Archaeological site	Quad Pond	2.11	N/A
JE01012	Archaeological site	Grade 19 Mound	0.82	N/A
JE01013	Archaeological site	Cut Over Mound	3.74	N/A
JE01015	Archaeological site	Davis Mound	0.03	N/A
JE01484	Archaeological site	Underwater Apalache	0.72	N/A
JE01487	Archaeological site	Treeline	0.98	N/A
JE01494	Archaeological site	The Old Camp Mound	20.62	N/A
JE01496	Archaeological site	Western Slough Mound	333.47	N/A
JE01509	Archaeological site	Vandalized Mound	1.61	N/A
JE01510	Archaeological site	Robert Calvin	1.19	N/A
JE01511	Archaeological site	Trail End	1.45	N/A
JE01512	Archaeological site	One Hole	0.40	N/A
JE01513	Archaeological site	Doublewide	0.59	N/A
JE01514	Archaeological site	South Doublewide	0.54	N/A
JE01515	Archaeological site	Stuck Cabin	0.90	N/A
JE01516	Archaeological site	Planted Pines West	33.43	N/A
JE01517	Archaeological site	Old House and Shell Mound	1.15	N/A
JE01519	Archaeological site	Harrington Camp Mound	1.20	N/A
JE01520	Archaeological site	Deer Mound	1.81	N/A
JE01521	Archaeological site	Cabbage Palm Mound	1.39	N/A
JE01522	Archaeological site	Apalachee Grade	1.28	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE01523	Archaeological site	Turkey Duster Mound	1.97	N/A
JE01524	Archaeological site	Blue Flag Mound	0.01	N/A
JE01526	Archaeological site	Spider Wort Mound	0.22	N/A
JE01527	Archaeological site	Center Stump Mound	0.10	N/A
JE01528	Archaeological site	Potters Mound	0.07	N/A
JE01529	Archaeological site	Egg Mound	0.11	N/A
JE01530	Archaeological site	Indian Pink Mound	0.06	N/A
JE01531	Archaeological site	Hunt Camp South	0.06	N/A
JE01532	Archaeological site	Shaker Screen Mound	0.09	N/A
JE01533	Archaeological site	Lord Dinty Mound	0.05	N/A
JE01534	Archaeological site	Stumpy Shovel Mound	0.11	N/A
JE01535	Archaeological site	North of Coon Bottom Mound	0.04	N/A
JE01536	Archaeological site	Seafood Hut Mound	0.16	N/A
JE01538	Archaeological site	Geode	0.59	N/A
JE01540	Archaeological site	Mossy Palm	0.11	N/A
JE01541	Archaeological site	Hitchcock Mound	0.02	N/A
JE01542	Archaeological site	Hank's Place	0.06	N/A
JE01543	Archaeological site	Uktena Mound	0.04	N/A
JE01544	Archaeological site	Svekevpe Mound	0.11	N/A
JE01545	Archaeological site	Tupelo Mound	0.11	N/A
JE01546	Archaeological site	Totkuhece Mound	0.11	N/A
JE01547	Archaeological site	Kissimmee Mound	0.19	N/A
JE01548	Archaeological site	Rock Pile Mound	0.10	N/A
JE01573	Archaeological site	Fishhook Flats	3.61	N/A
JE01582	Archaeological site	Rock Pile Island	0.49	N/A
JE01583	Archaeological site	Rock Pile Quarry	3.30	N/A
JE01584	Archaeological site	Vermin Hole Mound	0.19	N/A
JE01604	Archaeological site	Wacissa # 1	0.08	N/A
JE01605	Archaeological site	Wacissa # 2	0.23	N/A
JE01650	Archaeological site	The Joe Davis Site	0.13	N/A
JE01651	Archaeological site	Vandalized Mound East	0.12	N/A
JE01652	Archaeological site	LiDAR Mound	0.45	N/A
JE01653	Archaeological site	Snake Eyes Mound	0.27	N/A
JE01654	Archaeological site	Firebreak 14 Mound	0.24	N/A
JE01655	Archaeological site	Hosford Branch Quarry II	0.06	N/A
JE01656	Archaeological site	MU 4 Site 1	0.45	N/A
JE01657	Archaeological site	Photo Point 25	1.09	N/A
JE01658	Archaeological site	MU 10-2	0.29	N/A
JE01659	Archaeological site	MU 10-3	0.34	N/A
JE01660	Archaeological site	Bracken Fern Mound	0.77	N/A
JE01661	Archaeological site	MU 10-4	0.34	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE01662	Archaeological site	MU 10-5	0.25	N/A
JE01663	Archaeological site	MU 10-6	0.36	N/A
JE01664	Archaeological site	MU 10-7	0.25	N/A
JE01665	Archaeological site	MU 10-8	0.28	N/A
JE01666	Archaeological site	MU 20-1	0.31	N/A
JE01667	Archaeological site	MU 20-2	0.27	N/A
JE01668	Archaeological site	MU 20-3	0.31	N/A
JE01669	Archaeological site	MU 20-4	0.34	N/A
JE01670	Archaeological site	MU 20-5	0.19	N/A
JE01671	Archaeological site	MU 20-6	0.10	N/A
JE01672	Archaeological site	MU 20-7	0.04	N/A
JE01673	Archaeological site	MU 20-8	0.04	N/A
JE01674	Archaeological site	MU 20-9	0.03	N/A
JE01675	Archaeological site	MU 20-10	0.02	N/A
JE01676	Archaeological site	Runkle Mound	0.03	N/A
JE01677	Archaeological site	Hand Tool Mound	0.32	N/A
JE01678	Archaeological site	Initialed Mound	0.45	N/A
JE01679	Archaeological site	Old Metal Pipe	0.53	N/A
JE01680	Archaeological site	Grade 33 Hunt Camp	6.67	N/A
JE01681	Archaeological site	Circuit Board Site	1.52	N/A
JE01682	Archaeological site	Gallberry 1	0.59	N/A
JE01683	Archaeological site	Gallberry 2	0.08	N/A
JE01684	Archaeological site	Gallberry 3	0.72	N/A
JE01685	Archaeological site	Gallberry 4	2.70	N/A
JE01686	Archaeological site	Gallberry 5	5.73	N/A
JE01687	Archaeological site	Little Magnolia	0.30	N/A
JE01688	Archaeological site	Motorbike Mound	0.29	N/A
JE01689	Archaeological site	Lone Oak	0.15	N/A
JE01690	Archaeological site	Grade 15 Cutoff	3.64	N/A
JE01691	Archaeological site	Big Blue Road Site	0.10	N/A
JE01692	Archaeological site	Thalictrum Mound	0.08	N/A
JE01693	Archaeological site	Apalachee South	0.09	N/A
JE01696	Archaeological site	Concertina Wire Mound	0.07	N/A
JE01698	Archaeological site	Demos Mound	0.05	N/A
JE01699	Archaeological site	Joey and Harper's Island	2.93	N/A
JE01701	Archaeological site	Lost and Found Mound	0.72	N/A
JE01702	Archaeological site	Crayfish Hole	0.63	N/A
JE01703	Archaeological site	Cassidy Spring Site	3.60	N/A
JE01704	Archaeological site	Double Bridges Mound	0.83	N/A
JE01705	Archaeological site	Big Loop Site	0.08	N/A
JE01706	Archaeological site	Narrow Pine Road Site	0.32	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE01707	Archaeological site	Half Hammock Site 1	0.10	N/A
JE01708	Archaeological site	Half Hammock Site 2	0.09	N/A
JE01709	Archaeological site	Half Hammock Site 3	0.14	N/A
JE01710	Archaeological site	Half Hammock Site 4	0.34	N/A
JE01711	Archaeological site	Strange Sink	0.73	N/A
JE01712	Archaeological site	Sawdust Spur	0.86	N/A
JE01713	Archaeological site	Grade 31-1	0.33	N/A
JE01714	Archaeological site	Back Tram Mound	0.65	N/A
JE01715	Archaeological site	Grade 17-1	1.85	N/A
JE01716	Archaeological site	27-1	0.63	N/A
JE01717	Archaeological site	27-2	0.62	N/A
JE01718	Archaeological site	27-3	0.23	N/A
JE01719	Archaeological site	28-1	1.17	N/A
JE01720	Archaeological site	28-2	0.79	N/A
JE01721	Archaeological site	28-3	0.39	N/A
JE01722	Archaeological site	28-4	0.48	N/A
JE01723	Archaeological site	28-5	0.42	N/A
JE01724	Archaeological site	28-6	0.47	N/A
JE01725	Archaeological site	Clint's Fire	9.76	N/A
JE01726	Archaeological site	Gallberry 6	1.34	N/A
JE01727	Archaeological site	Gallberry 7	1.3	N/A
JE01728	Archaeological site	Grade 33 Hunt Camp	5.8	N/A
JE01729	Archaeological site	WS 1	0.70	N/A
JE01730	Archaeological site	G33	1.06	N/A
JE01731	Archaeological site	Ryan & Greg Site	4.12	N/A
JE01732	Archaeological site	Grade 17-2	3.44	N/A
JE01733	Archaeological site	Grade 17-3	1.72	N/A
JE01734	Archaeological site	Grade 35-1	2.00	N/A
JE01735	Archaeological site	Grade 35-2	0.74	N/A
JE01736	Archaeological site	Grade 35-3	0.61	N/A
JE01737	Archaeological site	Grade 35-4	1.39	N/A
JE01738	Archaeological site	Grade 26-1	3.16	N/A
JE01739	Archaeological site	Grade 26-2	1.34	N/A
JE01740	Archaeological site	Grade 26-3	1.63	N/A
JE01741	Archaeological site	Closed Road-1	1.17	N/A
JE01742	Archaeological site	Closed Road-2	0.82	N/A
JE01743	Archaeological site	Closed Road-3	0.65	N/A
JE01744	Archaeological site	Pinhook Tract 1	0.18	N/A
JE01745	Archaeological site	Pinhook Tract 2	1.29	N/A
JE01746	Archaeological site	Pinhook Tract 3	1.54	N/A
JE01747	Archaeological site	Loading Deck	0.60	N/A

FMSF No.	Resource Category	Resource Title	Acres	National Register of Historic Places Eligibility
JE01748	Archaeological site	Ginger Mound	0.50	N/A
JE01749	Archaeological site	Miss Ellie	0.73	N/A
JE01757	Archaeological site	The Morgan Patty Site	3.76	N/A
JE01779	Archaeological site	Pascuum Anserem Scatter	15.29	N/A
JE02379	Archaeological site	Glover's Quarry	11.28	N/A
JE02380	Archaeological site	Glory Quarry	0.12	N/A
JE01554	Linear Resource	Slave Canal	6.35	N/A

11.13 Land Management Review Report

2019 Land Management Review Team Report for Aucilla Wildlife Management Area

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1. 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.

1.1. Property Reviewed in this Report

Name of Site: Aucilla Wildlife Management Area

Managed by: Fish & Wildlife Conservation Commission

Acres: 50,471

Counties: Jefferson and Taylor

Purpose(s) for Acquisition: to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

Acquisition Program(s): CARL/P2000/Florida Forever

Original Acquisition Date: 1/1988

Area Reviewed: Entire Property

Last Management Plan Approval Date: 8/23/2016

Review Date: 1/11/19

Agency Manager and Key Staff Present:

- | | |
|--------------------------|---------------|
| • Morgan Wilbur, Manager | Phil Manor |
| • Amanda Smith | Billy Sermons |
| • Joe Davis | |

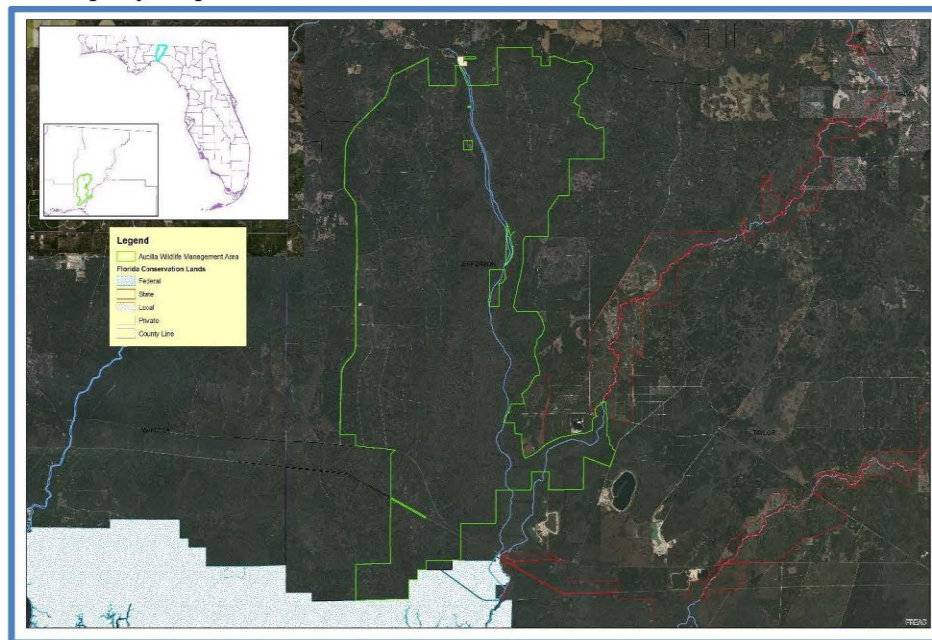
Review Team Members Present (voting)

- | | |
|------------------------------------|---|
| • John McKenzie, DRP District | • Heather Schmiede, FFS |
| • Local Gov't., None | • SRWMD, None |
| • Diana Pepe, FWC | • David Roddenberry, Cons. Organization |
| • Dante Dartiguenave, DEP District | • Mike Hauser, Private Land Manager |

Other Non-Team Members Present (attending)

- | | |
|-------------------------|--------------------------|
| • James Parker, DEP/DSL | • Josh Goodwin, DHR |
| • Jason O'Donoghue, DHR | • Jeannie Brodhead, FNPS |
| • John Kunzer, FWC | |

1.2 Property Map



1.3. 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	4.84	4.56
Prescribed Fire / Habitat Restoration	4.83	4.58
Hydrology	4.67	4.53
Imperiled Species	4.67	4.67
Exotic / Invasive Species	4.33	4.25
Cultural Resources	5.00	4.75
Public Access / Education / Law Enforcement	4.60	4.38
Infrastructure / Equipment / Staffing	4.47	N/A

Color Code (See Appendix A for detail)

Excellent Above Average Below Average Poor

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1.3.1 Consensus Commendations for the Managing Agency

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

1. The team commends the Florida Fish and Wildlife Conservation Commission (FWC) for their management of historical and cultural resources. Their efforts, including the location and monitoring of sites, as well as their work protecting known sites is a model for management units containing large numbers of cultural sites. (6+, 0-)
2. The team commends the FWC for flatwoods restoration efforts including thinning and midstory reduction. (6+, 0-)
3. The team commends the FWC for initiating efforts to restore pine plantations back to their former natural communities. Gradual removal of off-site pines, management of understory fuels, and prescribed burning have produced impressive results while preserving natural process. (6+, 0-)

1.3.2. 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 FWC give greater attention to recording actual occurrences of plant species and updating the plant list. (6+, 0-)

Managing Agency Response: FWC will update plant list with all known species occurrences for inclusion in the next management plan update.

2. Field Review Details

2.1 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 basin swamp, baygall, depression marsh, dome swamp, floodplain swamp, hydric hammock, mesic flatwoods, mesic hammock, scrubby flatwoods, sinkhole, spring-run stream, upland hardwood forest, wet flatwoods.
2. Listed species, plants and animals in general, and specifically gopher tortoise and wading birds.
3. Natural resource 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. Resource management (prescribed fire), specifically area being burned, frequency, and quality.
6. Restoration, specifically habitat restoration, hydrological restoration, and ephemeral pond restoration.
7. Forest management, specifically timber inventory, timber harvesting, reforestation/afforestation, and site preparation.
8. Non-native, invasive, and problem species, specifically prevention and control of plants and animals.
9. Hydrologic/geologic function, specifically roads/culverts/low water crossings and ditches.

10. Ground water and surface water monitoring, specifically quality and quantity.
11. Resource protection, specifically boundary survey, gates and fencing, signage, and law enforcement presence.
12. Adjacent property concerns, land use, specifically inholdings and additions.
13. Public access, specifically roads, parking, and boat access.
14. Environmental education and outreach, specifically wildlife, invasive species, habitat management activities, interpretive facilities and signs, recreational opportunities, and management of visitor impacts.
15. Management resources, specifically waste disposal, buildings, equipment, staff, and funding.

2.2. 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 in the field.

2.3. Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members						Average
		1	2	3	4	5	6	
Natural Communities (I.A)								
Basin Swamp	I.A.1	5	5	5	5	5	5	5.00
Baygall	I.A.2	5	5	5	5	5	5	5.00
Depression Marsh	I.A.3	5	5	4	4	5	5	4.67
Dome Swamp	I.A.4	5	5	4	4	5	5	4.67
Floodplain Swamp	I.A.5	5	5	5	5	5	5	5.00
Hydric Hammock	I.A.6	5	5	5	5	5	5	5.00
Mesic Flatwoods	I.A.7	5	5	4	4	5	5	4.67
Mesic Hammock	I.A.8	5	5	5	5	4	5	4.83
Scrubby Flatwoods	I.A.9	5	5	5	5	5	5	5.00
Sinkhole	I.A.10	5	5	5	5	5	5	5.00
Spring-run Stream	I.A.11	5	5	5		5	5	5.00
Upland Hardwood Forest	I.A.12	5	5	5	5	5	5	5.00
Wet Flatwoods	I.A.13	5	5	4		5	5	4.80
Natural Communities Average Score								4.89
Listed species: Protection & Preservation (I.B)								

Animals	I.B.1	5	3	5		5	5	4.60
Gopher tortoise	I.B.1.a	5	3	5	5	5	5	4.67
Wading Birds	I.B.1.b	5	4	5	5		5	4.80
Plants	I.B.2	5	3	5		5	5	4.60
Listed Species Average Score								4.67
Natural Resources Survey/Management Resources (I.C)								
Listed species or their habitat monitoring	I.C.2	5	5	5	5	5	5	5.00
Other non-game species or their habitat monitoring	I.C.3	5	5	5	5	5	5	5.00
Fire effects monitoring	I.C.4	5	4	4	4	5	5	4.50
Other habitat management effects monitoring	I.C.5	5	4	5	5	5	5	4.83
Invasive species survey / monitoring	I.C.6	5	4	5	4	5	5	4.67
Cultural Resources (Archeological & Historic sites) (II.A, II.B)								
Cultural Res. Survey	II.A	5	5	5	5	5	5	5.00
Protection and preservation	II.B	5	5	5	5	5	5	5.00
Cultural Resources Average Score								5.00
Resource Management, Prescribed Fire (III.A)								
Area Being Burned (no. acres)	III.A.1	5	4	5	4	5	5	4.67
Frequency	III.A.2	5	5	5	5	5	5	5.00
Quality	III.A.3	5	3	5	5	5	5	4.67
Resource Management, Prescribed Fire Average Score								4.78
Restoration (III.B)								
Habitat Restoration (Pine Plantation)	III.B.1	5	4	5	5	5	5	4.83
Hydrological Restoration	III.B.2	5	5	5	5	4	5	4.83
Ephemeral Pond Restoration	III.B.3	5	5	5	5	5	5	5.00
Restoration Average Score								4.89
Forest Management (III.C)								
Timber Inventory	III.C.1	5	4	5	5	5	5	4.83
Timber Harvesting	III.C.2	5	4	5	5	5	5	4.83
Reforestation/Afforestation	III.C.3	5	4	5	5	4	5	4.67
Site Preparation	III.C.4	5	4	5	5	5	5	4.83
Forest Management Average Score								4.79
Non-Native, Invasive & Problem Species (III.D)								
Prevention								
prevention - plants	III.D.1.a	5	3	5	4	5	5	4.50
prevention - animals	III.D.1.b	5	3	4	4	5	5	4.33
prevention - pests/pathogens	III.D.1.c	5	2	4	4	4	5	4.00
Control								
control - plants	III.D.2.a	5	4	5	4	5	5	4.67
control - animals	III.D.2.b	5	3	4	4	4	5	4.17
control - pest/pathogens	III.D.2.c	5	3	5	4	4	5	4.33

Non-Native, Invasive & Problem Species Average Score								4.33
Hydrologic/Geologic function Hydro-Alteration (III.E.1)								
Roads/culverts	III.E.1.a	5	5	5	5	5	5	5.00
Ditches	III.E.1.b	5	3	5	5	5	5	4.67
Hydrologic/Geologic function, Hydro-Alteration Average Score								4.83
Ground Water Monitoring (III.E.2)								
Ground water quality	III.E.2.a	5	4	5	5	4	5	4.67
Ground water quantity	III.E.2.b	5	4	5	4	4	5	4.50
Ground Water Monitoring Average Score								4.58
Surface Water Monitoring (III.E.3)								
Surface water quality	III.E.3.a	5	4	5	5	4	5	4.67
Surface water quantity	III.F.3.b	5	4	5	4	4	5	4.50
Surface Water Monitoring Average Score								4.58
Resource Protection (III.F)								
Boundary survey	III.F.1	5	4	5	5		5	4.80
Gates & fencing	III.F.2	5	5	5	4	4	5	4.67
Signage	III.F.3	5	5	5	5	4	5	4.83
Law enforcement presence	III.F.4	5	5	5	5	4	5	4.83
Resource Protection Average Score								4.78
Adjacent Property Concerns (III.G)								
Land Use								
Inholdings/additions	III.G.2	5	5	5	5	4	5	4.83
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)								
Public Access								
Roads	IV.1.a	5	5	4	4	4	5	4.50
Parking	IV.1.b	5	5	4	4	4	5	4.50
Boat Access	IV.1.c	5	4	4	4	4	5	4.33
Environmental Education & Outreach								
Wildlife	IV.2.a	5	3	4	4	4	5	4.17
Invasive Species	IV.2.b	5	3	4	4	5	5	4.33
Habitat Management Activities	IV.2.c	5	3	4	5	4	5	4.33
Interpretive facilities and signs	IV.3	5	4	4	4	4	5	4.33
Recreational Opportunities	IV.4	5	5	5	4	4	5	4.67
Management of Visitor Impacts	IV.5	5	4	5	4	4	5	4.50
Public Access & Education Average Score								4.41
Management Resources (V.1, V.2, V.3, V.4)								
Maintenance								
Waste disposal	V.1.a	5	3	4	4	4	5	4.17
Infrastructure								
Buildings	V.2.a	5	3	5	4	5	5	4.50

Equipment	V.2.b	5	4	5	4	5	4	4.50
Staff	V.3	5	4	5	4	5	5	4.67
Funding	V.4	5	4	5	4	5	4	4.50
Management Resources Average Score								4.47

Color Code:

Excellent	Above Average	Below Average
	Missing Vote	Insufficient Information

See Appendix A for detail

3. Land Management Plan Review Details

3.1 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 improvement in the management plan.

3.2 Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members						Average
		1	2	3	4	5	6	
Natural Communities (I.A)								
Basin Swamp	I.A.1	5	3	4	5	4	5	4.33
Baygall	I.A.2	5	3	4	5	4	5	4.33
Depression Marsh	I.A.3	5	3	4	5	4	5	4.33
Dome Swamp	I.A.4	5	3	4	5	4	5	4.33
Floodplain Swamp	I.A.5	5	3	4	5	4	5	4.33
Hydric Hammock	I.A.6	5	3	4	5	4	5	4.33
Mesic Flatwoods	I.A.7	5	3	4	5	4	5	4.33
Mesic Hammock	I.A.8	5	3	4	5	4	5	4.33
Scrubby Flatwoods	I.A.9	5	3	4	5	4	5	4.33
Sinkhole	I.A.10	5	3	4	5	4	5	4.33
Spring-run Stream	I.A.11	5	3	4	4	4	5	4.17
Upland Hardwood Forest	I.A.12	5	3	4	5	4	5	4.33
Wet Flatwoods	I.A.13	5	3	4	5	4	5	4.33
Natural Communities Average Score								4.32
Listed species: Protection & Preservation (I.B)								
Animals	I.B.1	5	5	5		5	5	5.00

Gopher tortoise	I.B.1.a	5	3	5	5	5	5	4.67
Wading Birds	I.B.1.b	5	3	5	5		5	4.60
Plants	I.B.2	5	3	4		5	5	4.40
Listed Species Average Score								4.67
Natural Resources Survey/Management Resources (I.C)								
Listed species or their habitat monitoring	I.C.2	5	4	4	5	5	5	4.67
Other non-game species or their habitat monitoring	I.C.3	5	4	5	5	4	5	4.67
Fire effects monitoring	I.C.4	5	2	4	4	5	5	4.17
Other habitat management effects monitoring	I.C.5	5	4	4	5	5	5	4.67
Invasive species survey / monitoring	I.C.6	5	4	4	5	5	5	4.67
Cultural Resources (Archeological & Historic sites) (II.A, II.B)								
Cultural Res. Survey	II.A	5	5	4	5	4	5	4.67
Protection and preservation	II.B	5	5	4	5	5	5	4.83
Cultural Resources Average Score								4.75
Resource Management, Prescribed Fire (III.A)								
Area Being Burned (no. acres)	III.A.1	5	4	4	5	5	5	4.67
Frequency	III.A.2	5	3	4	5	5	5	4.50
Quality	III.A.3	5	3	4	5	5	5	4.50
Resource Management, Prescribed Fire Average Score								4.56
Restoration (III.B)								
Habitat Restoration (Pine Plantation)	III.B.1	5	4	5	5	5	5	4.83
Hydrological Restoration	III.B.2	5	4	4	5	4	5	4.50
Ephemeral Pond Restoration	III.B.3	5	3	5	5	4	5	4.50
Restoration Average Score								4.61
Forest Management (III.C)								
Timber Inventory	III.C.1	5	4	5	5	5	5	4.83
Timber Harvesting	III.C.2	5	4	5	5	5	5	4.83
Reforestation/Afforestation	III.C.3	5	4	5	4	5	5	4.67
Site Preparation	III.C.4	5	4	5	5	5	5	4.83
Forest Management Average Score								4.79
Non-Native, Invasive & Problem Species (III.D)								
Prevention								
prevention - plants	III.E.1.a	5	3	4	5	4	5	4.33
prevention - animals	III.E.1.b	5	1	4	5	4	5	4.00
prevention - pests/pathogens	III.E.1.c	5	1	4	5	4	5	4.00
Control								
control - plants	III.E.2.a	5	4	4	5	5	5	4.67
control - animals	III.E.2.b	5	4	4	5	4	5	4.50
control - pest/pathogens	III.E.2.c	5	1	4	5	4	5	4.00
Non-Native, Invasive & Problem Species Average Score								4.25

Hydrologic/Geologic function, Hydro-Alteration (III.E.1)								
Roads/culverts	III.F.1.a	5	4	5	5	5	5	4.83
Ditches	III.F.1.b	5	3	5	5	5	5	4.67
Hydrologic/Geologic function, Hydro-Alteration Average Score								4.75
Ground Water Monitoring (III.E.2)								
Ground water quality	III.F.2.a	5	4	4	5	4	5	4.50
Ground water quantity	III.F.2.b	5	4	4	4	4	5	4.33
Ground Water Monitoring Average Score								4.42
Surface Water Monitoring (III.E.3)								
Surface water quality	III.F.3.a	5	4	4	5	4	5	4.50
Surface water quantity	III.F.3.b	5	4	4	4	4	5	4.33
Surface Water Monitoring Average Score								4.42
Resource Protection (III.F)								
Boundary survey	III.G.1	5	4	4	5	3	2	3.83
Gates & fencing	III.G.2	5	4	4	4	4	5	4.33
Signage	III.G.3	5	4	4	5	4	5	4.50
Law enforcement presence	III.G.4	5	4	4	5	4	5	4.50
Resource Protection Average Score								4.29
Adjacent Property Concerns (III.G)								
Land Use								
Inholdings/additions	III.H.2	5	4	4	4	4	5	4.33
Discussion of Potential Surplus Land Determination	III.H.3	5	5	4	5	4	5	4.67
Surplus Lands Identified?	III.H.4	5	5	4	5		5	4.80
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)								
Public Access								
Roads	IV.1.a	5	4	4	4	4	5	4.33
Parking	IV.1.b	5	4	4	4	4	5	4.33
Boat Access	IV.1.c	5	4	4	4	4	5	4.33
Environmental Education & Outreach								
Wildlife	IV.2.a	5	3	4	5	4	5	4.33
Invasive Species	IV.2.b	5	3	4	5	5	5	4.50
Habitat Management Activities	IV.2.c	5	3	4	5	4	5	4.33
Interpretive facilities and signs	IV.3	5	4	4	5	4	5	4.50
Recreational Opportunities	IV.4	5	5	5	5	4	5	4.83
Management of Visitor Impacts	IV.5	5	4	5	5	4	5	4.67
Public Access & Education Average Score								4.46
Managed Area Uses (VI.A, VI.B)								
Existing Uses								
Wildlife Viewing	VI.A.1	5	5	5	5	4	5	4.83

Hunting	VI.A.2	5	5	5	5	4	5	4.83
Fishing/Frogging	VI.A.3	5	5	5	5	4	5	4.83
Boating/Paddling	VI.A.4	5	4	5	5	4	5	4.67
Hiking	VI.A.5	5	5	5	5	4	5	4.83
Primitive camping	VI.A.6	5	5	5	4	4	5	4.67
Geocaching	VI.A.7	5	5	5	4	4	5	4.67
Interpretation/education	VI.A.8	5	5	5	4	4	5	4.67
Equestrian	VI.A.9	5	5	5	4	4	5	4.67
Apiaries	VI.A.10	5	5	5	4	4	5	4.67

Color Code:

Excellent	Above Average	Below Average
	Missing Vote	Insufficient Information

See Appendix A for detail

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*

11.14 Prescribed Burn Plan

**Aucilla Wildlife Management Area
Fire Management Plan**



Prepared June 2026 by:
Morgan Wilbur
Biological Scientist III
Aucilla WMA

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Purpose:

Prescribed fire is a tool that is essential to wildlife management, preserving many threatened and endangered plant and animal species, maintaining biological diversity, and reducing the threat of wildfires. Many ecosystems in the southeast are dependent upon fire for the maintenance of their biological integrity, with the exclusion of fire resulting in a loss of biological diversity (Brockway and Lewis 1997). The dependence on fire of many communities is demonstrated by the presence of plant species with fire tolerant characteristics. Some of these species require fire applied at specific times of year to promote regeneration and growth and to ensure their continued existence. The classic example in the southeast is wiregrass, which requires fire applied during the growing season with fire applied in May-June resulting in the greatest production of seed in wiregrass (Rodriguez and Bohn 2011). A long-term regime of prescribed fire can facilitate nutrient cycling and increase the abundance of insects and smaller animals, making fire an important process to the restoration and maintenance of natural ecosystems.

This plan will identify the potential burn units on Aucilla Wildlife Management Area (AWMA); describe vegetation types; discuss goals and objectives; identify elements of a prescribed burn plan; as well as firing techniques, fire line needs, and a strategy for evaluation and monitoring.

Area Description:

AWMA is located in Jefferson and Taylor counties, with the Aucilla River acting as the boundary between the two counties (Figure 1). The boundaries can be broadly described as follows: County Route 59 on the west, St. Marks National Wildlife Refuge on the south, the head waters of the Wacissa River on the north, and roughly, from less than ½ mile to 1 ½ miles east of the Wacissa River on the east. In the southern portion of Aucilla WMA, starting in Township 3 south, Range 4 east the boundary stretches east to Powell Hammock Rd. The AWMA extends south of U.S. 98 to the boundary of St. Marks National Wildlife Refuge.

As stated in Establishment Order No.: WMA 18-04, AWMA is comprised of 50,549 acres. Of this, the FWC is lead managing agency on 46,339 acres that were purchased by the Board of Trustees of the Internal Improvement Trust Fund (BOT), under the Conservation and Recreation Lands program (CARL). This burn plan will only deal with the land on which the FWC is lead managing agency. The lead managed portion of the AWMA was compiled through multiple acquisitions beginning in 1986, with the majority of the fire-maintained communities having been acquired since 2000. The remainder of AWMA is leased from the Suwannee River Water Management District.

The major vegetation communities on AWMA include hydric hammock, floodplain swamp, dome/strand swamp, basin swamp, baygall/titi, and upland hardwood forest. The natural communities specific to AWMA were mapped by Florida Natural Areas Inventory (FNAI) and are identified in Figure 2. In addition to these communities, AWMA contains many acres of land that were converted to pine plantation prior to state acquisition. These units were planted predominately in slash pine; however, loblolly pine was planted in a few areas. The historic natural communities of most of these areas were a combination of mesic and wet flatwoods, with wet prairie and scrubby flatwoods also represented, and it is these pyrophytic communities, totaling 14,117 acres, that will be discussed in this plan.

Thinning of the densely stocked plantations began in 2006-07 and is ongoing. To date, timber thinning goals and objectives of timber harvests have been to reduce the basal area to 40-60 sq/ft/ac using a third row geometric thin with logger select thin of leave rows, targeting stunted and defect trees or “thinning from below”, to reach the target basal area. Leaving a basal area of 40-60 is prescribed to maximize the amount of sunlight reaching the ground while allowing for enough needle cast to support the frequent application of prescribed fire. The understory on the area can be broadly characterized as shrubby and is composed of titi, gallberry, saw palmetto, shiny lyonia, sweet pepperbush, wax myrtle, shrubby oaks, and sweetgum. Blueberries and huckleberries are represented in the short shrub layer. The herbaceous groundcover is variable across the area but is generally sparse and is composed of bluestems, wiregrass, Florida drop seed, witchgrasses, and other grasses and forbs.

Goals and Objectives:

Prescribed fire will be used to achieve a variety of long-term and short-term goals and objectives on AWMA. Prior to state acquisition, fire was excluded as a management tool for an unknown period but at least since the conversion of the area to silviculture. As such, our primary short-term objectives were to reduce fuel loads and decrease the dense woody understory vegetation to facilitate the achievement of future habitat improvement and timber management goals. The primary long-term goal for prescribed fire on AWMA is to restore historic fire dependent ecological communities. This will be done in conjunction with other timber management techniques (i.e. selective thinning, reforestation) to reduce the artificially high basal area of the remaining densely stocked pine stands and reintroduce longleaf pine to appropriate sites. Prescribed fire will be used to improve and maintain habitat for wildlife, including threatened and endangered species, by increasing the production of grasses and forbs, increasing the quality of browse, and maintaining openings for foraging and travel lanes.

Other objectives that are accomplished via prescribed burning include:

- 1) Improve access for hunting and other outdoor recreation.
- 2) Aesthetic enhancement and increased visibility by reducing dense understory vegetation.
- 3) Increase diversity of flora and fauna.
- 4) Reduce the potential of wildfire by decreasing fuel loads.

Burn Timing and Frequency

Historic and pre-historic fires can be attributed to two sources: lightning and humans. Humans have been present in the Western Hemisphere for at least 14,000 years and utilized fire for various purposes including heat, light, food preparation, and hunting, but it is unknown to what degree these human-caused fires changed the land-cover due to spatial and temporal limitations of paleological data (Ryan et al. 2013). Native Americans also used fire to cultivate plants for food, medicine, and basket making, as well as to significantly modifying the landscape for game management or travel (Pyne 1982). Historically, fires caused by humans were ignited during the dormant season when weather patterns were more predictable and daytime temperatures would minimize damage to overstory pines. Additionally, dormant season fire was preferred to avoid destroying nests of ground dwelling birds, especially northern bobwhite and wild

turkey. A review of research on the effects of growing season burning conducted by Cox and Widener (2008) suggests that threats posed to nesting birds are not as severe as has been thought and that there are benefits, like improved foraging habitat, that may offset nests lost to fire. However, additional research is needed on several species. In Florida, the frequency of lightning is high, especially during the months of June, July, and August. Though the month of May doesn't have the high frequency of lightning as the subsequent summer months, fuels in May are often dry which results in a high probability of ignition in May and June before the summer rains begin to reduce the drought index. Fill et al. (2012) suggest that wiregrass reproduction is linked to the phenology of growing season fires, because lightning ignited fires were more predictable than human ignited fires and that the stochastic nature of human ignited fires makes it unlikely that wiregrass would exhibit such strong or persistent selection over centuries. In their literature review, Fill et al. (2012) indicate a significant effect of fire season on the fruiting and flowering of almost all dominant grasses, with those burned during the growing season exhibiting significantly greater reproduction. Species in the genera *Pityopsis*, *Stylosanthes*, and *Liatris* also respond positively to growing season fires. A study of fire scars from old longleaf pine stumps near Apalachicola recorded 61 fires over a 189 year period from 1679-1868 (Huffman 2006). Most fires occurred at two year intervals (42%) with an average return interval of 3.2 years; 72% of all fires occurred within one to three year intervals; and 95% of all fires documented prior to 1830 (before European settlement) occurred during the growing season. A long term study conducted in a flatwoods community in Georgia suggests dormant season burning on a one-to-three-year interval can increase the cover of grasses significantly compared to unburned plots (Brockway and Lewis 1997). The study, conducted over a 40-year period, indicates that frequent dormant season fire can be used to maintain a grass dominated flatwoods community.

Prescribed fire on AWMA will be applied during both the dormant and growing seasons with a target frequency of one to three years. Burning in both the dormant and growing seasons will maximize the opportunity to meet or exceed acreage goals and keep burn units within the desired return interval.

The first burn applied after a timber harvest will be during the dormant season to reduce fuel loads and minimize damage to the residual overstory. After fuel loads are reduced, growing season burns will be utilized whenever possible, however, an emphasis will be placed on maintaining the one to three year frequency. For example, if a scheduled growing season burn cannot be completed within three years of the last burn, then that burn unit will be burned at the next available opportunity (where opportunity is dictated by weather and site conditions). Priority will be given to burn units that are within or near the desired fire return interval over burn units that have not been burned in a long time, particularly un-thinned pine plantations. Fire will generally be excluded from un-thinned pine plantations to avoid unnecessary pine mortality, reducing the value of this public resource. Additionally, anecdotal observations indicate burning within densely stocked pine plantations with near 100% crown closure provides little benefit to the understory or to wildlife. Though burning these plantations will reduce the stature and cover of shrubs, the canopy does not allow enough light to the forest floor to allow for a response from any remnant groundcover.

Weather:

At AWMA, a burn prescription is developed which outlines acceptable weather parameters for conducting prescribed fires activities within a particular burn unit. These include both legally required parameters and agency/division required parameters.

Legally required weather parameters:

- Surface wind speed and direction
- Transport wind speed and direction
- Minimum mixing height
- Minimum relative humidity
- Maximum temperature
- Minimum fine fuel moisture

Additional agency/division required weather parameters:

- Dispersion index
- Keetch-Byram Drought Index (KBDI)
- Low Visibility Occurrence Risk Index (LVORI)
- Days since ½" of rain

Acceptable values are prescribed for each of these parameters for each prescribed burn. Many factors influence how values are prescribed. These include the vegetative and wildlife goals and objectives for the burn unit; needs for safe implementation and control of the fire, including crew safety and keeping the fire within the authorized area; the juxtaposition of the burn unit in relation to adjacent burn units, vegetation communities, and private property; the fuel types/fuel models of the burn unit and adjacent burn units; the burn history of the burn unit and of adjacent burn units; and the proximity to smoke sensitive areas.

Smoke Management:

Key elements when considering smoke management are wind direction/speed (surface and transport winds); fuel loading; volume of smoke and smoke dispersion; and proximity and distance to smoke sensitive areas. During prescribed fire operations, a slightly unstable atmosphere is desirable. To minimize potential impacts on smoke sensitive areas, prescribed fire activities should be conducted with a minimum mixing height of 1700 ft and transport wind speeds of at least 7 mph.

Crew members will monitor smoke throughout each burn to ensure sufficient lift and dispersion. Ignition will be complete at such a time as to allow for complete burnout of the unit and for smoke plumes to disperse. Crew will mop up areas producing a lot of smoke as needed. If smoke has the potential to impact a public roadway during a prescribed burn, smoke caution signs will be erected, and Florida Highway Patrol (FHP) will be notified. In the days following a burn, if a public roadway is impacted by smoke, FHP will be notified, and smoke caution signs will be erected. If assistance from FHP is required, FWC staff will remain in communication with FHP until there is no longer a risk to the public roadway. Jefferson County Sheriff's Office, FWC law enforcement, and local Florida Forest Service (FFS) partners may also be notified if needed.

Permits and Notifications:

A permit will be obtained from FFS on the afternoon prior or the morning of each burn in accordance with Chapter 590.125 Florida Statutes. Notification of a prescribed burn will be emailed to appropriate FWC Northwest region personnel, Wildlife and Habitat Management section leadership, and the FWC statewide call center. Efforts will be made to notify landowners when burning adjacent to private inholdings.

Firing Techniques:

When prescribed fire is applied to an area, different firing techniques can be implemented to produce various results; depending on the predetermined objectives for a given area. Sometimes, several different firing techniques may be used within a burn unit to achieve more than one goal or to produce a mosaic habitat within that unit.

Some factors associated with various firing techniques that should be considered are listed below.

- 1) Backing fires: must be ignited along downwind control line (black line); good for use in heavy rough; low scorch probability; need continuous fuels to carry fire; won't burn well with high fine fuel moisture; low intensity but long residence time; short flame length; long burn time results in higher cost.
- 2) Heading fires: fast fire movement allows for large blocks to be burned; may not be good in heavy rough; can be used with high fine fuel moisture and relative humidity; higher probability of crown scorch; high intensity but short residence time; long flame length; fast moving fire results in lower cost.
- 3) Flanking fires: requires steady wind direction; best used in light to medium rough; moderate intensity, residence time and flame length relative to backing and heading fires.
- 5) Point source fires: exhibit characteristics of all three firing techniques above; most of area will be burned by heading and flanking fires, and little by backing fires; wind direction may be variable; ignition grid can be continually modified to accommodate changing fuels and weather.

Methods:

Prescribed burns on AWMA begin with a test fire ignited in a downwind corner of the burn unit. Fire behavior observed during the test fire is used to determine whether conditions are suitable to proceed with the prescribed burn. If the burn is authorized to continue, a backing fire and short, controlled strip-head fires are used while relative humidity remains high to secure the baseline of the burn unit. The baseline typically consists of roads and constructed firelines located along the downwind perimeter of the unit. Establishing a widened blackline along this boundary creates a more secure and controllable buffer between the active fire and adjacent downwind stands, thereby reducing the potential for spot fires outside the authorized burn area. It also allows burn personnel to focus resources along this critical boundary during the early stages of the operation and respond quickly to any developing issues.

Once an adequate blackline has been established along the baseline, interior ignition of the burn unit will commence. The selection of ignition methods and firing techniques is based on several factors, including burn-unit size, fuel loading, wind speed and direction, fine dead fuel moisture, ambient temperature, relative humidity, desired burn objectives, and the proximity of smoke-sensitive areas and private property. Because many burn units are large and substantial acreage must be treated annually to meet fire-frequency objectives, aerial ignition using a helicopter and a point-source grid pattern is the primary ignition method employed across much of the AWMA. Smaller burn units may be ignited using a similar

grid pattern with drone technology. In some areas, ground-based ignition techniques may be used, including backing fires, point-source fires, flanking fires, and strip-head fires.

Equipment:

Equipment assigned to AWMA for prescribed fire operations includes a Type VI wildland fire engine, all-terrain vehicles (ATVs) and utility terrain vehicles (UTVs) equipped with spray tanks, a Type III tractor-plow unit, and a Freefly Alta-X unmanned aircraft system (UAS) integrated with a Drone Amplified Ignis II aerial ignition platform. Equipment requirements will vary based on burn objectives, fuel conditions, unit size, and operational complexity. Consequently, not all assigned equipment will be necessary for every prescribed burn, while additional resources from outside the management area may be required for larger or more complex prescribed burns. Helicopter support, obtained through private contractors, FFS, or the FWC Division of Law Enforcement, will be utilized for most prescribed burn operations. Hand tools, including fire rakes and/or shovels, shall be carried on all ATVs/UTVs and Type VI engines operating on the fireline.

All personnel participating in prescribed fire operations shall wear the appropriate personal protective equipment (PPE) in accordance with the Division of Habitat and Species Conservation Prescribed Burning and Wildland Fire Suppression Standards. Required PPE includes flame-resistant shirts and pants or coveralls, a wildland fire hard hat, leather gloves, lace-up leather boots with a minimum 8-inch upper, eye protection, a handheld radio, and a fire shelter. When operational needs exceed available on-site resources, additional personnel and equipment may be mobilized from other WMAs, divisions, or sections to support safe and effective implementation of prescribed fire activities.

Personnel:

Personnel required to safely conduct prescribed burns at AWMA is based on several factors including the size and complexity of the burn unit, fuel loading within the burn unit, burn history of adjacent units, proximity to smoke sensitive areas or the WMA boundary, mop up requirements, and weather conditions. Additional staff may be called in from other WMAs, sections, divisions, and inter-agency cooperators as needed. All those participating on AWMA prescribed burns will meet appropriate training, certification, and experience standards as described in the Division of Habitat and Species Conservation, Prescribed Burning and Wildland Fire Suppression Standards.

Firelines:

AWMA contains an extensive network of existing roads and established firebreaks, substantially reducing the need for new fireline construction. Firelines adjacent to private properties are typically maintained as disked lines and are refreshed annually to ensure effectiveness and minimize the amount of vegetative encroachment between burn events. Several prescribed burn units are bordered by wetland communities, where the natural transition between upland and wetland systems provides highly effective firebreaks. Utilizing these natural boundaries further minimizes the need for mechanical fireline construction while also promoting the maintenance and development of ecotones.

Maximizing the use of existing roads, maintained firelines, and natural firebreaks not only enhances operational efficiency but also reduces potential adverse impacts associated with fireline construction,

such as soil disturbance, alteration of hydrologic processes, and inadvertent damage to undocumented archaeological or cultural resources. The addition of new firelines or the widening/improving of existing firelines will be evaluated by area and regional staff and will be constructed/improved as deemed necessary to facilitate prescribed burning activities.

Burn Units:

Seventy-four potential burn units have been identified on AWMA totaling 24,402 acres (Figure 2). The percentage of each burn unit occupied by fire maintained community types ranges from 40%-60%.

Burn Prescriptions:

All burns will be conducted in compliance with the Division of Habitat and Species Conservation, Prescribed Burning and Wildland Fire Suppression Standards (Appendix A). Prescriptions for individual burn units will not be discussed in this plan. To ensure compliance with legal requirements and professional standards, all burn prescriptions prepared for AWMA will include the following 17 elements. A sample prescription template form is included with this plan (Appendix B).

Legally Required Elements:

1. Stand or site description
2. Map of the area being burned
3. Firebreaks (external and internal) to be constructed or re-worked
4. Number of personnel and equipment types to be used
5. Desired weather factors, including but not limited to:
 - a. surface wind speed and direction
 - b. transport wind speed and direction
 - c. minimum mixing height
 - d. minimum relative humidity
 - e. maximum temperature
 - f. minimum fine fuel moisture
6. Desired fire behavior factors such as:
 - a. type of burn technique
 - b. flame length
 - c. rate of spread
 - d. fuel conditions
7. Time and date the prescription was prepared
8. The authorization date and time and period of authorization
9. An evaluation of the anticipated impact of the proposed burn on related smoke sensitive areas
10. Signature and number of Certified Prescribed Burn Manager

Professional Standards:

11. Purpose and objectives
12. Safety

13. Description of fuel conditions
14. Season and time of day
15. Notifications
16. Ignition plan
17. Public relations
18. Contingencies, control and mop up, declaring fire out
19. Evaluation and monitoring

Evaluation and Monitoring:

Evaluation and monitoring are an ongoing, multi-tiered process that will be conducted at both the burn unit level and the natural community level. Burn units and natural communities, along with weather conditions, are continually monitored prior to a burn to maximize the potential of meeting the burn objectives that have been set. This process continues during the burn to include monitoring of fire behavior patterns and weather conditions to ensure that conditions are within the prescription parameters set. Firing techniques or patterns will be adjusted during the operational phase of each burn in order to ensure that burn objectives are met and that fire behavior patterns are within set parameters. Post burn monitoring of the forecast weather patterns and of each burn unit will continue after each burn to check for prolonged combustion and identify any areas in need of mop-up and will continue until the burn unit meets the standards set for declaring the fire out.

Long term monitoring will be accomplished at the natural community level using the protocols identified in the Objective Based Vegetation Management (OBVM) program. The data will be collected by FNAI and will provide a feedback loop to area managers that will allow them to determine if the attributes are within or being driven toward the desired future conditions (DFC) set for that natural community. This feedback loop allows area managers the ability to evaluate effects of management actions as well as identify areas where different or additional management actions may be required to drive the community towards the DFC. To supplement the OBVM monitoring data, a system of photo point stations will be established that will provide area managers with a visual representation of changes to the burn units and natural community over time.

Boundary Unit Analysis:

Boundary units require special consideration prior to conducting prescribed burn operations. These considerations are addressed by the boundary unit analysis (BUA). This analysis is required for each AWMA burn unit that shares property boundaries with another entity, private, state-owned, etc. Each BUA outlines several important components that need to be evaluated and/or addressed prior to burning to minimize the chance of a fire escape onto non-FWC properties. These components include but are not limited to: average fuel loading within the burn unit, hazardous fuels within 100 ft inside of the WMA boundary, extended ignition threats within 100 ft inside of the WMA boundary, length of burn unit perimeter along WMA boundary that must be monitored to prevent escape, adjacent land-use type, closest distance to dwelling or structure, and others. BUAs are approved by regional leadership before each burn.

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Table 1: Natural Community and Altered Landcover Types

Community Type	GIS Acres	Percentage
Artificial Pond	64.14	0.14%
Basin Swamp	7,462.35	16.45%
Baygall	3,059.38	6.74%
Depression Marsh	39.28	0.09%
Developed	11.82	0.03%
Dome Swamp	898.11	1.98%
Firebreak	18.70	0.04%
Floodplain Swamp	646.34	1.42%
Hydric Hammock	15,919.32	35.08%
Linear Feature	0.67	<0.01%
Mesic Flatwoods	421.55	0.93%
Mesic Hammock	1,640.78	3.62%
Pasture - Improved	3.98	0.01%
Pine Plantation	1,223.77	2.70%
Restoration Mesic Flatwoods	6,974.41	15.37%
Restoration Mesic Hammock	204.22	0.45%
Restoration Sandhill	50.00	0.11%
Restoration Scrubby Flatwoods	19.03	0.04%
Restoration Upland Hardwood Forest	5.80	0.01%
Restoration Wet Flatwoods	4,793.61	10.56%
Restoration Wet Prairie	45.68	0.10%
Road	593.36	1.31%
Scrubby Flatwoods	2.34	0.01%
Sinkhole	0.63	<0.01%
Spring-run Stream	256.35	0.56%
Upland Hardwood Forest	608.15	1.34%
Utility Corridor	29.11	0.06%
Wet Flatwoods	382.53	0.84%

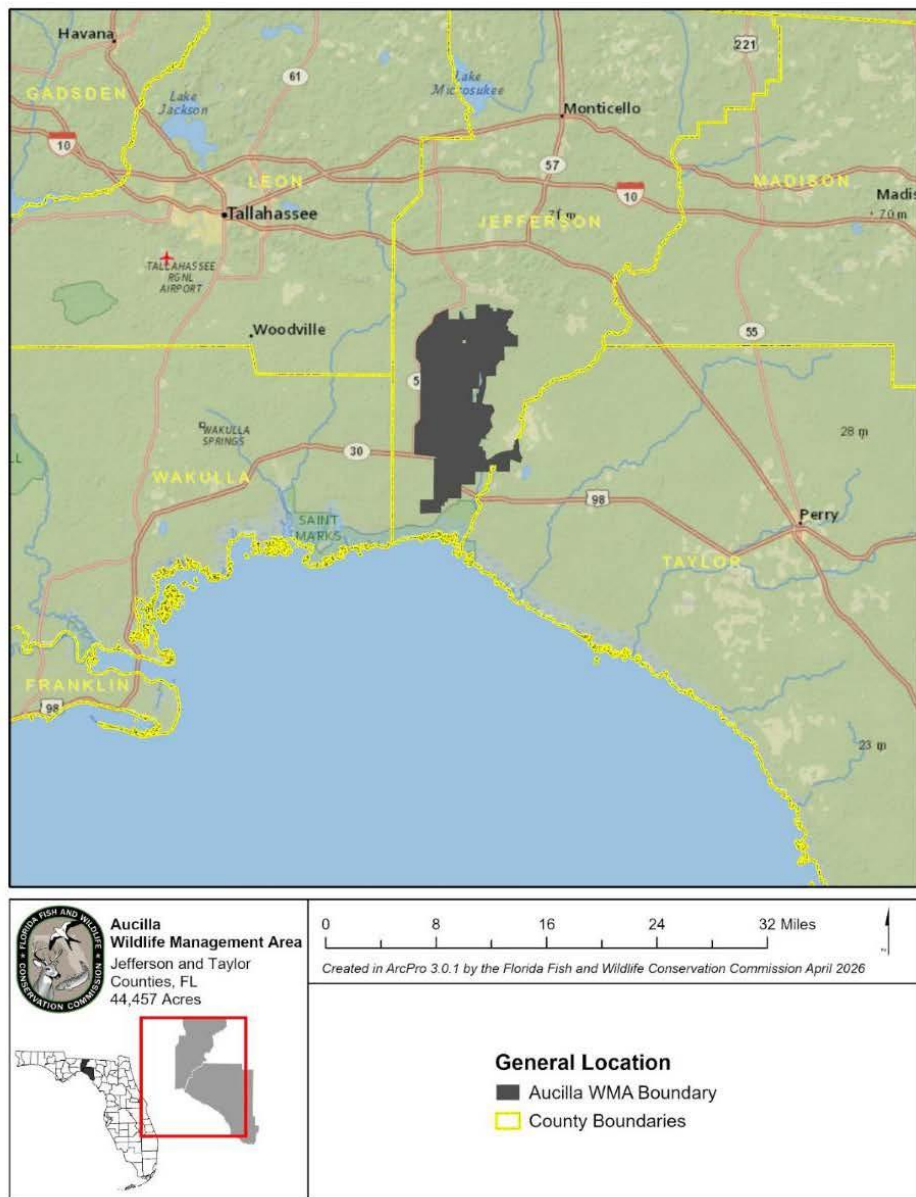


Figure 1: Aucilla WMA Vicinity Map

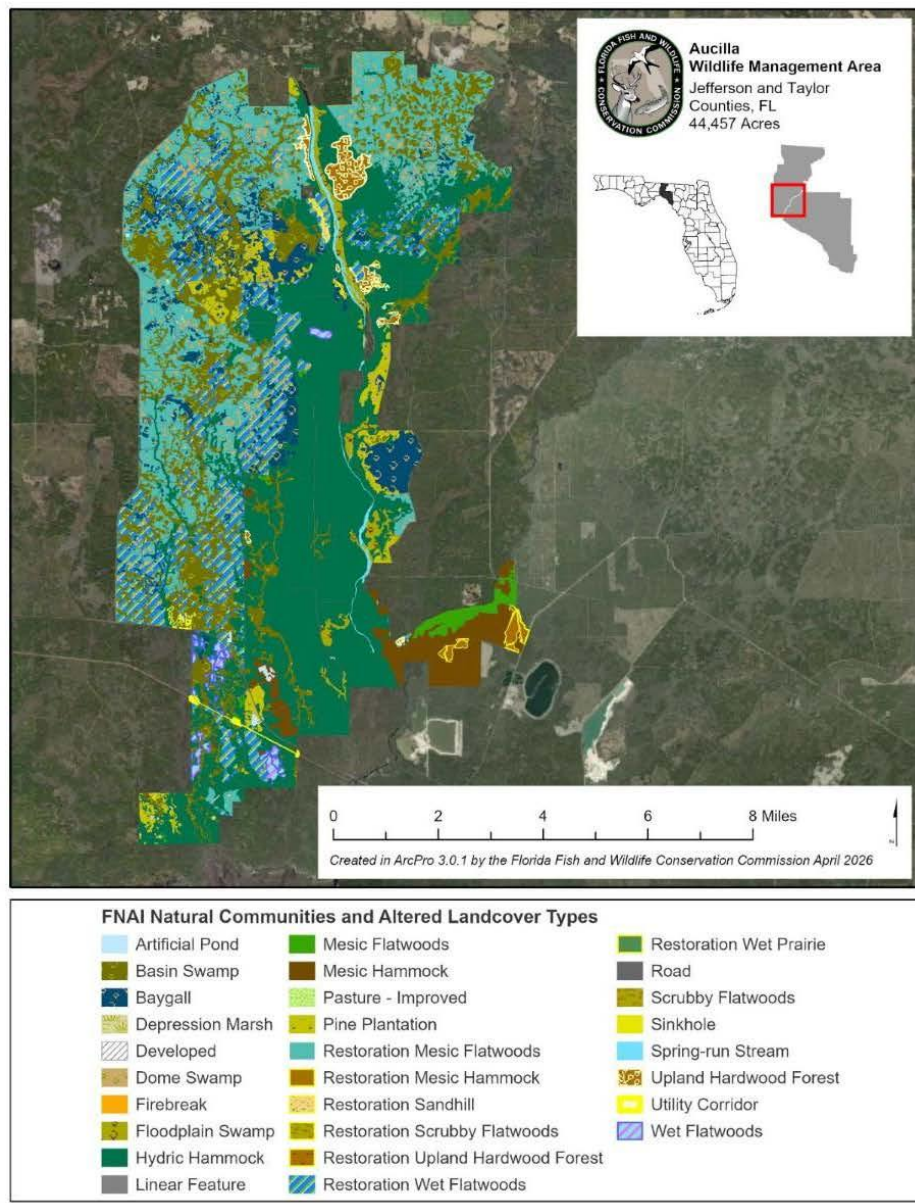


Figure 2: FNAI Current Natural Communities and Altered Landcover Types

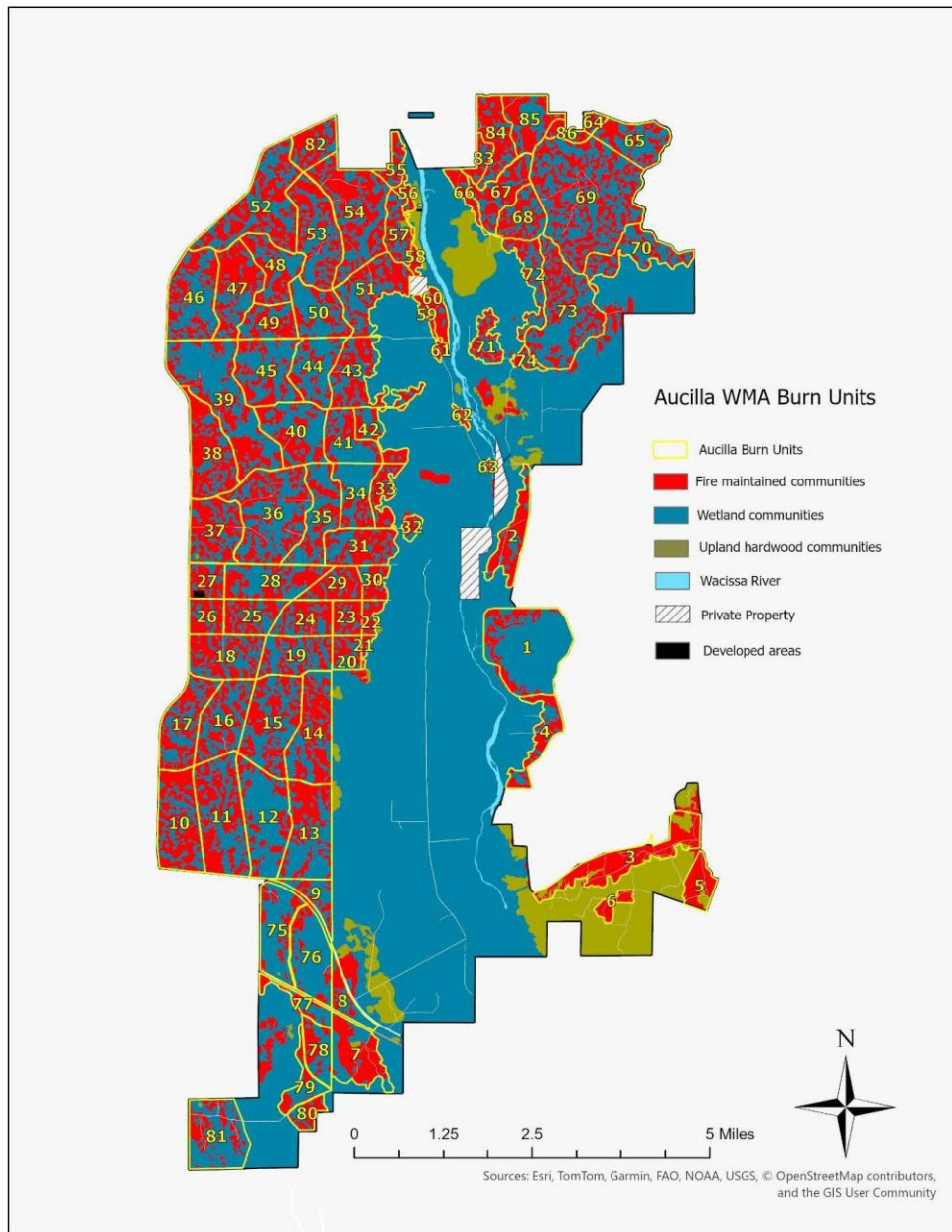


Figure 3: Aucilla WMA Burn Units

Appendix A: Prescribed Burning and Wildfire Suppression Standards

**Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Policies and Procedures
Updated February 2025**

Subject: Prescribed Burning and Wildland Fire Suppression Standards

Policy:

The following policy shall apply to all Division of Habitat and Species Conservation (DHSC) employees, volunteers and contractors engaged in prescribed burning or wildland fire suppression activities. Unless otherwise stated, the policy also applies to all other Florida Fish and Wildlife Conservation Commission (FWC) employees and volunteers engaged in prescribed burning or wildland fire suppression activities conducted through the DHSC. Prescribed burning or wildland fire suppression efforts that DHSC funds through grants, cost-share agreements, or other methods not conducted on DHSC-managed lands are outside the scope of this policy; however, DHSC staff physically participating in these burns are required to comply with the policy and this policy should be used to guide minimum standards regarding training and experience when developing DHSC-funded agreements or contracts. This policy will be reviewed at least once every three years.

Background and General Guidelines:

Wildland fire has been a major force shaping Florida landscapes for thousands of years. Florida's plant communities are the result of surface water conditions and frequent lightning ignitions across its vast landscape. Many plant communities experienced fire every few years and wildlife species adapted to these fire-maintained habitats. Floridians have consistently used fire as a land management tool and the Florida legislature recognizes the importance of prescribed burning per Chapter 590.125 F.S.

Likewise, DHSC recognizes the importance of prescribed fire for Florida's diverse wildlife and the habitats that sustain them. As Florida continues to lose natural wildlife habitat, prescribed fire is more important than ever in maintaining and enhancing our remaining natural areas. As FWC is the lead managing agency on more than 1.5 million acres of the Wildlife Management Area (WMA) system, DHSC regularly conducts burns on these lands, and others, for wildlife management, hazardous fuel reduction, and ecological purposes. DHSC also provides financial support and technical assistance for conducting prescribed burns outside of the WMA system.

In addition to conducting prescribed burning, DHSC employees are periodically asked to assist the Florida Forest Service (FFS) with wildland fire suppression efforts, particularly during declared wildfire emergencies. Working on prescribed fires or wildfires is an inherently dangerous and risky activity that can result in significant property damage, personal injury, or loss of life. Therefore, it is necessary to establish standards for training and certification to ensure DHSC employees, volunteers and contractors have the appropriate skills and knowledge

to perform these activities safely and effectively. Employees are encouraged to obtain higher levels of training and certification as warranted and approved through supervisory channels.

The majority of DHSC wildland fire activities occur within the Wildlife and Habitat Management Section (WHM). However, other Sections within DHSC have employees that participate in wildland fire activities. To ensure efforts are not duplicated, this policy designates specific WHM staff positions as the point of contact or lead on coordination for prescribed fire and wildland fire suppression activities conducted through DHSC.

Employees are responsible for acquiring (with agency funds and supervisor approval) and maintaining all required personal protection equipment. Immediate supervisors are responsible for ensuring that direct reports have all the required training to participate in wildland fire activities. WHM Regional Wildlife Biologists will be responsible for coordinating applicable wildland fire training and incident reviews through the WHM Section Leader or their designee.

All prescribed burns shall be conducted in compliance with all laws regulating the use of prescribed fire; specifically Chapter 590.125(3), Florida Statutes and Chapter 5I-2, Florida Administrative Code. When a DHSC employee, volunteer or private contractor is the burn manager, burn prescriptions shall be prepared using the FWC Prescribed Burning Prescription form and contain all the required elements per Chapter 5I-2.006 Florida Administrative Code, as well as all other applicable information requested on the prescription form. Prescriptions shall be prepared with employee and public safety as the highest priority. All prescribed burns shall be conducted as a certified prescribed burn within prescription, and managed by a Certified Prescribed Burn Manager.

All prescribed fires conducted on FWC lead WMAs shall be documented within the WHM Land Management Information System according to the procedures and schedules determined by the WHM Section Leader.

Chapter 1 Prescribed Burning

Prescribed Burn Participation: This section establishes the training, certification, and experience standards required for members of a prescribed burn team. These standards apply to all DHSC burn crew members, regardless of the location of the burn, and for all non-DHSC crew members on burns managed by DHSC staff and/or conducted on DHSC-managed land unless otherwise noted.

- A. **Crew Member Trainee:** Those who do not meet the requirements for Crew Member shall be classified as a Crew Member Trainee. A Crew Member Trainee may participate in prescribed burning activities provided that they are under the direct supervision of a Crew Member. A Crew Member may supervise no more than one Crew Member Trainee. No more than 40% of the burn crew shall be Crew Member Trainees*. They shall have successfully completed the following level of training:

2

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- 1) Successful completion of fire shelter or fire shelter refresher training within the past 13 months;

**For prescribed burns conducted during a DHSC-coordinated training course, Crew Members may supervise more than one Crew Member Trainee, and more than 40% of the burn crew may be Crew Member Trainees.*

- B. Crew Member: Crew members may participate independently in prescribed burning activities. They shall have successfully completed the following National Wildfire Coordinating Group (NWCG) courses and other training and testing requirements:

- 1) Introduction to the Incident Command System (I-100 or ICS-100);
- 2) Basic Wildland Firefighter Training (S-130);
- 3) Introduction to Wildland Fire Behavior (S-190);
- 4) Successfully completed fire shelter or fire shelter refresher training within the past 13 months;
- 5) At least once every 36 months, all DHSC employees shall successfully complete an agency-approved wildland fire refresher training course;
- 6) At least once every 36 months, all DHSC employees and volunteers shall successfully complete the DHSC [Physical Abilities Test \(PAT\)](#).*

**New DHSC employees may participate on prescribed burns as crew members during their first year of employment without taking the PAT, provided they meet all other requirements.*

- C. Prescribed Burn Manager Mentee: Prescribed burn manager mentees may serve as burn manager to fulfill the responsibilities of acquiring DHSC and Florida Certified Prescribed Burn Manager status. Mentee must be under the direct supervision of a DHSC Certified Prescribed Burn Manager on prescribed burns that will be used to qualify them for DHSC Certified Prescribed Burn Manager status. They shall have successfully completed the following level of training and have the specified level of experience:

- 1) Qualified at or above Crew Member level for prescribed burning;
- 2) The FFS Florida Certified Prescribed Burn Manager Training Course;
- 3) Participated on at least five prescribed burns;
- 4) Enrolled in or completed the [DHSC Prescribed Burn Manager Mentoring Program](#).

Note: The DHSC Director may approve staff to attend the Prescribed Fire Correspondence Course during times when the Florida Certified Prescribed Burn Manager Training Course has reduced or no availability.

- D. Certified Prescribed Burn Manager: A DHSC Certified Prescribed Burn Manager may request prescribed burn authorizations and serve as burn manager for acreage burns.

They shall have successfully completed the following level of training and have the specified certification and level of experience:

- 1) Qualified at or above Crew Member level for prescribed burning;
- 2) FFS Prescribed Burn Manager Certification (per section 590.125, Florida Statutes and 5I-2, Florida Administrative Code);
- 3) Participated on at least ten prescribed burns;
- 4) DHSC employees and volunteers must successfully complete the [DHSC Certified Prescribed Burn Manager Mentoring Program](#) to become a burn manager. Burn managers certified prior to the implementation of the mentoring program may be required to complete all or part of the mentoring program at the discretion of the WHM Regional Biologist, or DHSC Division Director or designee for all non-WHM employees;
- 5) Complete the [FFS requirements to maintain Florida Certified Prescribed Burn Manager status per 5I-2.006](#).

Note: Any employee aspiring to become a Certified Prescribed Burn Manager must obtain certification within three years of completing the Florida Certified Prescribed Burn Manager Training Course. Otherwise they must re-take the full course to become certified. If the certification lapses, the employee may re-certify by successfully completing the FFS Prescribed Fire Correspondence Course if they served as a burn manager on five or more burns. Otherwise they must re-take the full course to regain certification.

- E. Certified Pile Burner: A Certified Pile Burner may request pile burn authorizations. They shall have successfully completed the following level of training and have the specified certification and level of experience:

- 1) Qualified as a Certified Prescribed Burn Manager;
- 2) FFS Certified Pile Burner.

- F. Prescribed Burn Engine (Pumper Unit/Brush Truck) Operator: To independently operate a water-delivery engine in support of prescribed burns, crew members shall have successfully completed the following level of NWCG training and have the specified level of experience:

- 1) Qualified at or above Crew Member level for prescribed burning;
- 2) Demonstrated proficiency in operation of water-delivery engines to supervisor; *or* successful completion of Southern Area Engine Academy (S-211 and SA-214) or Engine Operator (PMS 419);
- 3) Participated on at least five prescribed burns.

- G. Prescribed Burn Bulldozer Plow Unit Operator: To independently operate a dozer plow unit during prescribed burns, crew members shall have successfully completed the following level of training and have the specified level of experience:
- 1) Qualified at or above Crew Member level for prescribed burning;
 - 2) The wildland fire portion of FFS Basic Fire Control Training (or equivalent training);
 - 3) Participated on at least five prescribed burns;
 - 4) Experience and demonstrated proficiency to supervisor operating a dozer plow unit.
- H. Prescribed Burn Aerial Plastic Sphere Dispenser (PSD) Operator: To independently operate a PSD from an aircraft during a prescribed burn, crew members shall have successfully completed the following level of training and have the specified level of experience:
- 1) Qualified at or above Crew Member level for prescribed burning;
 - 2) Completed an aerial PSD training course;
 - 3) Participated on at least five prescribed burns;
 - 4) Complete aerial PSD refresher training once every three years.
- I. Prescribed Burn Unmanned Aircraft System (UAS) Aerial Ignition Operator: To independently operate a UAS for ignition missions during a prescribed burn, crew members shall have successfully completed the following level of training and have the specified level of experience:
- 1) Qualified at or above Crew Member level for prescribed burning;
 - 2) Participated on at least five prescribed burns;
 - 3) Be familiar with and follow [FWC IMPP 1.35](#) and the [Small Unmanned Aircraft Systems \(sUAS\) Use and Safety Manual](#) and any additional DHSC or WHM Section policy or guidance related to operation of UAS.
 - 4) Possess current FAA Remote Pilot Certification (Part 107);
 - 5) Complete FAA Part 107 Remote Pilot Certification recurrent training every two years;
 - 6) Complete appropriate manufacturer's drone ignition system training;
 - 7) Flown a minimum of one flight with an ignition drone in the last 90 days.

Chapter 2 Wildland Fire Suppression

Wildland Fire Suppression Participation: The leadership of FFS, or other entity, may request assistance from FWC during a wildland fire suppression incident. This request will usually be for a wildland fire strike team to conduct mop-up operations. A wildland fire strike team consists of one wildland fire strike team leader, and two wildland fire strike team members per Type V or VI engine. Occasionally there will be a request for a bulldozer operator to facilitate mop-up operations. Standards for strike team members and leaders are outlined below. In addition,

requests may be made for personnel to fill positions on a suppression incident that are not covered by the following standards. The decision to assist, and the level of assistance provided, on fire suppression incidents will be made by the DHSC Division Director or their designee. Coordination of all requests will be handled by the WHM Section Leader or their designee.

- A. Wildland Fire Strike Team Member: To participate on wildland fire strike teams in support of suppression efforts, strike team members shall have successfully completed the following level of training and have the specified level of experience:

- 1) Qualified at or above Crew Member level for prescribed burning;
- 2) Southern Area Engine Academy or PMS 419*;
- 3) Participated on at least ten prescribed burns and/or wildland fire suppression incidents.

**Employees who have not yet completed Southern Area Engine Academy or PMS 419 can be approved by the WHM Section Leader or their designee to serve on a wildland fire strike team. Exceptions can be granted when available strike team personnel are not sufficient to meet the requested need. Training and experience levels should be considered when approving exceptions.*

- B. Wildland Fire Strike Team Leader: To serve as team leader for wildland fire strike teams in support of suppression efforts, strike team members shall have completed the following level of training and have the specified level of experience:

- 1) Qualified at or above Wildland Fire Strike Team Member;
- 2) Basic Incident Command System (I-200 or ICS-200);
- 3) Experience as a Certified Prescribed Burn Manager on at least ten prescribed burns and experience as a Wildland Fire Strike Team Member on at least one incident.

- C. Wildland Fire Bulldozer Plow Unit Operator: To independently operate dozer fire-plow units in support of suppression efforts, strike team members shall have completed the following level of training and have the specified level of experience:

- 1) Qualified at or above Crew Member level for prescribed burning;
- 2) Dozer Operations on Florida Prescribed Burns, the wildland fire portion of FFS Basic Fire Control Training, or an equivalent course as approved by the DHSC Division Director;
- 3) Participated on at least ten prescribed burns or wildland fire suppression incidents;
- 4) Experience and demonstrated proficiency to supervisor operating a dozer plow unit.

Chapter 3 Safety

3.1 Personal Protective Equipment (PPE): Required Personal Protective Equipment for all wildland fire activities includes*:

- A. Flame Resistant Shirt and Pants, or Jumpsuit
- B. Wildland Fire Hard Hat
- C. Leather Gloves
- D. Leather Boots – $\geq 8"$ Lace-up
- E. Eye Protection
- F. Hand-held Radio
- G. Fire Shelter

**Safety considerations and/or vegetation types may dictate that crew members wear additional equipment or deviate from the above required equipment. The burn manager/strike team leader shall determine what PPE will be worn by their crew to maximize safety, and shall document any deviations on their burn prescription or wildfire crew briefing report.*

3.2 Physical Standards: Prescribed burning and fire suppression are physically demanding activities. In addition to successfully completing the PAT, each prescribed burn crew/strike team member shall maintain a fitness level that will allow full participation in these activities. It is the burn crew/strike team member's responsibility to make the burn manager/strike team leader aware of any limitations that may restrict or prevent full participation.

3.3 Mobile Equipment: The following is a list of required items for mobile equipment used during wildland fire activities. Mobile equipment includes all-terrain vehicles, utility vehicles, airboats, swamp buggies, trucks, tractors, and bulldozers.

- A. An ABC fire extinguisher that has been inspected, serviced, and maintained in accordance with the manufacturer's maintenance procedures shall be in or on all mobile equipment. Below are minimum extinguisher sizes (net extinguishing agent weights):
 - 1) All-terrain and utility vehicles – 2.5 pound
 - 2) Trucks and tractors – 5 pound
 - 3) Bulldozers and Swamp Buggies – 10 pound (could be two 5 pound extinguishers)
 - 4) Vessels – 5 pound (could be two 2.5 pound extinguishers)
- B. All-terrain vehicles, utility vehicles, swamp buggies, and trucks used in the interior of a burn unit shall have an operational winch.
- C. All mobile equipment used in the interior of a burn unit shall have an operational water delivery system with at least five gallons of water.

3.4 Public Safety: All wildland fire operations shall be conducted in a manner that protects the public and minimizes the potential adverse impacts of both smoke and fire. Prescriptions shall be prepared with public safety as the highest priority.

Chapter 4 Incident Reviews

This chapter outlines the procedure for reviewing a prescribed fire whose results include negative consequences on DHSC managed lands or from a burn managed by a DHSC burn manager. The purpose of a fire-related incident review is to gather facts regarding the incident and, if possible, recommend actions that may help minimize the chance of reoccurrence.

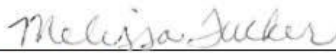
4.1 Fire-related Incident: A fire or smoke related incident that includes any of the following:

- A. FFS Notice of Violation;
- B. Conducting a burn outside of the prescription;
- C. Fire leaves the prescribed burn unit and resources in addition to the burn crew are utilized;
- D. Fire leaves the WMA system;
- E. Prescribed burn activities cause property damage or personal injury;
- F. Post-burn combustion poses a threat to public safety, property, or natural resources.

4.2 Reporting of Fire-related Incidents: The burn manager shall notify the appropriate WHM Regional Biologist about the incident as soon as possible, but no later than 8:30 am the day after the fire-related incident occurred. For extended post-burn combustion, the burn manager shall notify the Regional Biologist if the combustion and/or associated smoke may pose a threat to public safety, property, or natural resources. The Regional Biologist shall notify the WHM Section Leader or their designee of the incident as soon as possible. The notification should include the following:

- A. Date, time, and location of incident;
- B. Brief description of the incident and current status;
- C. Other agencies or entities assisting;
- D. Resources needed.

4.3 Fire-related Incident Review: The WHM Section Leader shall determine the need for and the scope of fire-related incident reviews. The WHM Section Leader or their designee will coordinate the incident review. Within 60 days of completing a fire-related incident review, the reviewer(s) shall submit a report to the DHSC Division Director for approval.

Approved:		April 29, 2025
	Division Director	Date

Appendix B: Division of Habitat and Species Conservation Burn Prescription Template

Prescribed Burning Prescription Florida Fish and Wildlife Conservation Commission					
WMA/WEA: Click here to enter managed area			Management Lease/Agreement Number: Enter number		
Burn Manager: Burn manager name			Customer Number: Number		
Burn Manager Certification Number: Number			County of Burn: County		
FFS Certified Burn Authorization Number:			Date of Burn: Date of burn		
Authorization Date and Time Period:					
Burn Unit Names/Numbers	Acres	Section(s)	Township	Range	Last Burn Date
Unit name/number	Acres	Section	Township	Range	Date
Unit name/number	Acres	Section	Township	Range	Date
Unit name/number	Acres	Section	Township	Range	Date
Unit name/number	Acres	Section	Township	Range	Date
Total	Total Acres				
Latitude/Longitude or Road Intersection to Assist with Emergency Locate: Enter Lat/Long and/or intersection					
Nearest Helicopter Landing Zone and Coordinates: Click here to enter. LZ should be in open grassy or asphalt/concrete area; not sandy.					
Unit Description and Habitat Composition - Attach Maps of Area to be Burned					
Overstory Description and Basal Area if Applicable: Click here to enter description					
Understory Description: Click here to enter description					
Fuel Loading – May Vary for Different Areas of the Burn Unit (Very Heavy, Heavy, Moderate, Light, Very Light): Click here to enter fuel loading					
Known Duff or Muck Locations: Click here to enter duff or muck locations					
Hazards, Infrastructure and Wildlife Features to Protect: Click here to enter along with locations					

Description and Condition of Fire Breaks: Click here to enter description and make sure firebreaks (internal and external) are shown on map	
Other Important Stand Parameters if Applicable: None	
Restoration Burn ☐ Maintenance Burn ☐	
Burn History and Vegetative Description of Surrounding Units (and/or attach map):	
Emergency Contacts (can be attachment)	
FFS Dispatch:	
FFS Forest Area Supervisor(s): Click here to enter contact info	
Local Fire Departments: Click here to enter number	
Local Hospitals or Emergency Care Centers: Click here to enter number	
FHP:	DOT:
FWC Dispatch:	
Other: Click here to enter	
Notifications (e-mail group, adjacent landowners, schools, airports, media, etc): Click here to enter notifications or include attachment with notifications	
Minimum Number of Personnel to be Used on the Burn: Enter minimum number of personnel	
Personnel Names and Crew Assignments: Click here to enter personnel/assignments	
Equipment and Suppression Tools to be Used on Burn:	

Purpose of Burn:
Measurable Burn Objectives:
Season and Time of Day to Meet Objectives: Click here to enter season/time of day for fire to meet your objectives
Firing Plan and Ignition Method/Pattern: Click here to enter plan/pattern
Intensity Desired to Meet Purpose and Objective:
Contingencies (includes safety zones, escape routes, secondary control lines, escape response procedures): Click here to enter contingencies
Mop-up and Monitoring Standards: Click here to enter standards
Declaring the Fire Out Standards: Click here to enter standards

Smoke Management
Smoke Sensitive Areas Identified Using "A Guide for Prescribed Fire in Southern Forests" Smoke Screening Tool? ☐ Yes ☐ No
Any Critical Smoke Sensitive Areas Identified? ☐ Yes ☐ No If "Yes", Do Not Burn Under Current Prescription, or Provide Additional Smoke Monitoring and Mitigation Procedures in the Smoke Management Plan. Work with Florida Forest Service on Approval to Burn When Identifying Critical Smoke Sensitive Areas That May Be Impacted.
Downwind/Downdrainage Smoke Sensitive Areas and Distance from Burn: Click here to enter areas
Other Smoke Sensitive Areas and Distance from Burn: Click here to enter areas
Smoke Management Plan (attach smoke management screening maps):
Is There Potential for Smoke to Impact a Public Roadway? ☐ Yes ☐ No If yes, you need to erect smoke warning signs. Contact FHP if smoke will impact a federal or state roadway (not including WMA roads). Contact local LE agencies as needed to inform them of potential smoke impacts.
Plan for Monitoring Smoke During and After the Burn to Assess Visibility Issues if Applicable:

WEATHER PARAMETERS	Desired Parameters	Forecast Conditions – Attach Fire Weather Forecast and Spot Weather Forecast. Use Separate Form for Actual Weather Readings
Surface (20') Wind Direction	Desired wind directions	Located on Forecast
Surface (20') Wind Speed	Desired wind speeds	Located on Forecast
Transport Wind Direction	Desired wind directions	Located on Forecast
Transport Wind Speed	Desired wind speeds	Located on Forecast
Minimum Mixing Height	Minimum mixing height	Located on Forecast
Dispersion Index (DAY)	Desired dispersion range	Located on Forecast
Dispersion Index (NIGHT)	Desired minimum dispersion	Located on Forecast
Maximum Temperature	Desired max temperature	Located on Forecast
Minimum Relative Humidity	Desired minimum humidity	Located on Forecast
Minimum Fine Fuel Moisture	Desired minimum fuel moisture	Estimated Fine Fuel Moisture
KBDI	Desired max KBDI	KBDI
LVORI	Desired max night LVORI	Located on Forecast
Fire Danger Index	Do Not Populate	FDI
Days since 1/8" Rain	Desired days since 1/8" rain	Actual
Additional Field	Additional Field Parameter	
Additional Field	Additional Field Parameter	
FIRE BEHAVIOR		
Rate of Spread	Desired rate of spread	Pertinent Observations on Evaluation
Starting Time	Desired starting time	Actual Starting Time Below
Flame Length	Desired flame length	Pertinent Observations on Evaluation

PRE-BURN CHECKLIST – Check off as completed prior to burn.
BURN MANAGER: Check each item to indicate compliance. ☐ All prescription requisites met. ☐ Authorization obtained. ☐ All equipment required on scene and fully operational. ☐ Each crew member has required personal gear and clothing. ☐ Appropriate steps have been taken to ensure crew and public safety including signs for visitors and motorists

CREW BRIEFING – Check off as discussed prior to burn.
☐ Objectives of burn. ☐ Exact area of burn including unit size and boundaries (ensure crew members have maps). ☐ Hazards discussed (volatile fuels, spotting potential, weak points in perimeter lines, terrain features, fences, ditches, etc.). ☐ Predicted weather and anticipated fire behavior/smoke dispersal discussed. ☐ Crew assignments made. ☐ Weather monitoring assignment made. ☐ Ignition technique and pattern. Holding method(s). ☐ Location of extra equipment, fuel, water, vehicle keys. ☐ Authority and communications; conduct radio check. ☐ Contingencies covered including escape routes or procedures. ☐ Sources of nearest assistance. Nearest phone and emergency numbers. ☐ Special instructions regarding smoke management, contact with the public and others. ☐ Safety briefing. Any EMTs on burn crew? ☐ Mop-up standards discussed. ☐ Arrange next day inspection and mop-up assignments. ☐ Questions? ☐ Crewmembers given opportunity to decline participation (is there anything that is going to prevent full physical performance?). ☐ Conduct test burn.

Prescription Prepared by: <i>Name</i>	Date/Time Prescription Prepared/Updated:
Burn Manager Signature/Date/Time:	
Start Time:	Completed Time:
Time Crew Released:	Time Burn Manager Left Burn Unit:
Date Fire Declared Out:	Evaluated Objectives, Recorded Pertinent Burn Notes, and Entered into LMIS ☐

Evaluation Notes

11.15 Wildlife Conservation Prioritization and Recovery Program (WCPR) Strategy

Aucilla
Wildlife Management Area
Wildlife Management Strategy

March 2019

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/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 (1) provide land managers with information on management and monitoring actions that should be taken, provided the necessary resources are available, (2) promote the presence and facilitate the persistence of wildlife species on the area, and (3) provide measurable objectives that can be used to evaluate the success of wildlife management on the area.

This document presents the results of a science-informed process for evaluating the needs of locally important species on Aucilla Wildlife Management Area (AWMA). 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 AWMA in regional and statewide conservation initiatives throughout the process.

[Section 1](#) introduces the reader to WHM's management style and describes the purpose or intent for 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 habitat management, monitoring, coordination recommendations, and measurable objectives identified.

[Section 4](#) identifies coordination and "beyond the boundaries" opportunities that will assist in conserving locally important species.

Continuation of resources at current levels would be 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 Aucilla WMA. As such, we would like to highlight the agency, local, and statewide experts that helped shape the discussion, including Dave Almquist, Janell Brush, David Cook, Andrew Cox, Terry Doonan, Adrienne Doyle, Kevin Enge, Anna Farmer, Craig Faulhaber, Johanna Freeman, Pierson Hill, Dan Hipes, Patty Kelly, Thomas Kuhn, Brooke Talley, Jennifer Manis, Will McDearman, Brad O'Hanlon, Mike Orlando, Eric Seckinger, Brian Scheick, Amy Schwarzer, Dave Telesco, Chris Tucker, Kent Williges, 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

Acronym	Description
AWMA	Aucilla Wildlife Management Area
BA	Basal Area
BMPs	Best Management Practices
BMU	Bear Management Unit
FNAI	Florida Natural Areas Inventory
F.S.	Florida Statutes
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
ISMP	Imperiled Species Management Plan
NWR	National Wildlife Refuge
SaMP	Survey and Monitoring Protocol (database)
SAP	Species Action Plan
SMA	Strategic Management Area
SRWMD	Suwannee River Water Management District
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
WCPR	Wildlife Conservation Prioritization and Recovery (program)
WHM	Wildlife and Habitat Management (section)
WMA	Wildlife Management Area

Locator Map



Section 1: Introduction

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 then 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 Aucilla Wildlife Management Area (AWMA) 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 (1) provides land managers with information on management and monitoring actions that should be taken, provided the necessary resources are available, (2) facilitates the persistence of locally important wildlife species on the area, and (3) provides measurable objectives that can be used to evaluate the success of wildlife management on the area. 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

AWMA comprises approximately 50,549 acres in southern Jefferson and western Taylor counties. The Suwannee River Water Management District (SRWMD) is lead manager on approximately 4,210 acres of the eastern portion of AWMA, with FWC serving in a cooperative role. The area is part of a corridor of conservation lands extending to the Gulf of Mexico that includes Avalon Plantation, managed by Turner Endangered Species Fund; Flint Rock WMA, managed by The Nature Conservancy (TNC); St. Marks National Wildlife Refuge, managed by the United States Fish and Wildlife Service (USFWS); and several other properties. The city of Tallahassee lies approximately 15 miles to the northwest. State Road 59 forms the WMA's western border and private lands border the WMA to the north, east, and southeast. The southwestern portion of AWMA is adjacent to Flint Rock WMA. There are 4 inholdings on AWMA consisting of fishing and hunting camps.

The State acquired AWMA to protect the watershed of the Wacissa and Aucilla Rivers, protect the area's significant cultural and historical resources, and provide the public with opportunities for natural resource-based recreation. Due to AWMA's significance in protecting the Wacissa and Aucilla Rivers, the area has a role in the conservation of species identified in the Imperiled Species Management Plan (ISMP) and State Wildlife Action Plan that would be adversely affected by degradation of these rivers. For example, the Big Blue Springs cave crayfish (*Procambarus horsti*) occurs in Big Blue Springs on the Wacissa River and in a sinkhole on AWMA near the springs. The [USFWS 12-month finding](#) on a petition to federally list this species, published in 2017, states that the species does not warrant federal listing and discusses the importance of public lands in providing protection for its habitat, specifically mentioning AWMA as one of these lands. By following best management practices (BMPs) to protect water quality when conducting natural community restoration, AWMA staff will continue to maintain suitable habitat for this and other species inhabiting the Wacissa and Aucilla Rivers.

The State purchased AWMA through 7 acquisitions occurring between 1986 and 2018. Prior to state acquisition, AWMA was managed by timber companies primarily for industrial pulpwood production. Management practices included land clearing, windrowing, bedding, row planting of offsite pine species, ditching, road construction, and fire suppression. As a result, both the structure and function of the landscape were altered. Natural hydroperiods and flow patterns were interrupted where water was intercepted and redirected by ditches associated with road construction. The uplands were transformed from an open canopied longleaf pine (*Pinus palustris*)-wiregrass (*Aristida spp.*) community to a closed canopied slash pine (*P. elliotii*) and loblolly pine (*P. taeda*) plantation with a tall, dense shrub layer. Characteristic plant and animal species were greatly reduced or locally extirpated.

2.1: Habitat Management

Section 4 of [AWMA's Management Plan](#), completed in 2016, lists in detail management objectives that staff accomplished over the last 10 years. To restore natural communities ([Appendix 1](#)) and improve wildlife habitat, staff implemented a prescribed burn plan that encourages growing season burns, where appropriate, and utilizes dormant season burns to reduce fuel loads. Other accomplishments include thinning slash and loblolly plantations, conducting chemical treatments of invasive exotic plants, and installing culverts and low water crossings to restore natural hydrology.

The [2009 WCPR Strategy](#) delineated Strategic Management Areas (SMAs) to target restoration efforts for the Bachman's sparrow (*Peucaea aestivalis*), brown-headed nuthatch (*Sitta pusilla*), frosted flatwoods salamander (*Ambystoma cingulatum*), gopher tortoise (*Gopherus polyphemus*), and red-cockaded woodpecker (*Picoides borealis*). The SMAs focused on restoring wet, mesic, and scrubby flatwoods in the northern and western portions of the WMA. The Strategy recommended applying a minimum of 3 prescribed burns in all SMAs, thinning the basal area in specific Management Units within the SMAs, and clearing shrubby vegetation from potential breeding wetlands in the flatwoods salamander SMA. Staff accomplished these

recommendations during the 10 years of the Strategy's implementation. The SMA designation is no longer needed because the planned habitat management actions listed below will maintain the improvements made since 2009, as well as continue to restore wildlife habitat on the area.

Over the next 10 years, the continued restoration of mesic and wet flatwoods communities ([Appendix 1](#)) will be the focus of habitat management on AWMA. The actions outlined below will improve habitat for several locally-important species that Aucilla's mesic and wet flatwoods could potentially support, including the Bachman's sparrow, frosted flatwoods salamander, gopher tortoise, and red-cockaded woodpecker.

Timber Management

- Staff will continue thinning dense slash and loblolly plantations using 3rd row thin and logger select thin of leave rows to achieve a residual 50-60 ft²/ac basal area (BA).
- Staff will evaluate previously thinned plantations and schedule additional timber harvests to achieve a residual BA of 30 ft²/ac or use a patch cut harvest pattern to prepare stand for conversion to longleaf pine, or to plant small patches of longleaf pine in appropriate sites.

Mechanical Treatments

- In sites dominated by shrubs such as titi (*Cyrilla racemiflora*, *C. monophylla*) and tall gallberry (*Ilex coriacea*), staff will utilize understory brush mowing and roller chopping to reduce undesirable woody species and favor herbaceous species. As all mechanical treatments need to be followed by prescribed fire, staff will not mechanically treat more than can be burned.
- Staff will evaluate various techniques for establishing herbaceous species, either from the seed bank or by direct seeding in plantations (example: using old tractor tires or old dozer tracks as potential drags to break up remaining duff layers and disturb the upper layer of mineral soil).

Chemical Treatments

- As needed, staff will utilize herbicide treatments to control undesirable woody vegetation (titi, tall gallberry, etc.) to favor herbaceous species and facilitate the establishment of longleaf pine.
- Staff will continue treatment of non-native invasive plants.

Direct Seeding

- Staff will evaluate the efficacy of under-planting pine stands with wiregrass and other native herbaceous species on the large scale needed for restoration.

Prescribed Fire

- Staff will burn flatwoods, alone or in combination with one or more of the above actions, on a <3year rotation, with a goal of achieving a 2-year average return interval that incorporates both dormant and growing season fire.

- After a timber thin, staff will apply a dormant season fire to reduce heavy fuel loads created by logging operations. Two dormant season burns may be needed before attempting to apply growing season fire in a stand.
- The strategy to increase the application of growing season fire will include scheduling burns during the growing season 13-18 months after the last dormant season burn.
- If there is not an opportunity to burn during any given growing season due to hydrological conditions or otherwise, then a burn unit will be burned at the next available opportunity to maintain a fire return interval of ≤ 3 years.

Restoration of Embedded Wetlands

- To facilitate burns carrying through wetland basins, staff will reduce the hardwood midstory in approximately 80 acres of ephemeral wetlands. Work will include hand clearing and cut-stump herbicide treatments in ~50 acres, and foliar herbicide treatments in ~30 acres.
- Staff will strive to burn blocks that contain priority wetlands during the growing season.

2.2: Monitoring

2.2.1 Past Monitoring

Monitoring recommendations in the 2009 Strategy included: conducting avian point counts for focal songbirds and adding additional monitoring stations to provide better coverage in the SMAs, monitoring limpkins (*Aramus guarauna*) on the Wacissa River with a protocol that broadcasts calls, conducting gopher tortoise surveys, dip-netting wetlands identified by the Fish and Wildlife Research Institute (FWRI) as potential breeding sites for frosted flatwoods salamanders, conducting annual float counts for wading birds, and opportunistically monitoring other locally important species. Staff accomplished these monitoring recommendations during the 10-year life of the Strategy. Results from these efforts informed the species assessments in [Section 3](#).

In addition to the monitoring actions outlined in the 2009 Strategy, staff annually conduct aerial surveys for wading bird colonies and bald eagle (*Haliaeetus leucocephalus*) nests. Staff currently maintain 25 wood duck (*Aix sponsa*) nest boxes on the Wacissa River but plan to remove these boxes due to limited use. While hunting occurs on the area, staff do not operate check stations to collect harvest data.

2.2.2 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 of an indicator species, a species whose presence indicates well managed natural communities that will also benefit other species. Some species exist as both imperiled and as an indicator. The Species Assessments ([Section 3](#)) detail

species' status and specific monitoring actions. On AWMA the following species will receive dedicated monitoring:

- Frosted flatwoods salamander
- Barbour's map turtle
- Bald eagle nest monitoring
- Limpkin monitoring
- Wading bird colony monitoring

2.2.3: Inventories

During the 10-year lifetime of this Strategy, staff will conduct taxa inventory surveys for the main terrestrial vertebrate species with a goal to repeat at approximately 10-year intervals. Conducting periodic inventories on lands within the WMA system accomplishes several purposes. Inventories will provide an up-to-date species list for the area and may alert staff to potential species declines that warrant further investigation.

Recent inventories conducted by area staff include annual avian point counts, and a drift fence survey for reptiles and amphibians that staff completed in fiscal year 2016-17. Workshop participants agreed that staff can modify avian counts to cover multiple habitats, seasons, and times of day to build a complete species list and inform area management. A survey of ephemeral wetlands targeting amphibians is scheduled for fiscal year 2018-19. During the 10-year lifetime of this Strategy, staff will conduct an inventory to catalogue mammal species, which will likely prioritize a bat inventory. Species of interest identified by experts include the tricolored bat (*Perimyotis subflavus*) and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*). Per our conversation with subject matter experts, groups such as the North American Butterfly Association may reach out to document locally important invertebrates. Subject matter experts identified several Species of Greatest Conservation Need and Florida Natural Areas Inventory (FNAI)-tracked species that are known to or could potentially occur on the area, and the inventory style monitoring should help determine if these species occur on AWMA.

2.2.4: Document Occurrence

The following species could potentially occur on AWMA and should be documented, if observed. Collecting this information will help further our understanding of the species' ranges statewide as well as the area's role in the conservation of these species. Record observations of these species when encountered using WHM's [Opportunistic Observations for Wildlife protocol](#) and enter the data into SaMP so it will be available to other FWC sections and divisions, as well as cooperating agencies and organizations.

- Ornate chorus frog (*Pseudacris ornata*)
- Alligator snapping turtle (*Macrochelys apalachicola*)
- Spotted turtle (*Clemmys guttata*)
- Eastern diamondback rattlesnake (*Crotalus adamanteus*)
- Eastern indigo snake (*Drymarchon couperi*)

- Eastern king snake (*Lampropeltis getula*)
- Black rail (*Laterallus jamaicensis*; potential wintering habitat in wet prairie, open wet flatwoods)
- Bat roosts (multiple species)
- Eastern spotted skunk (*Spilogale putorius*)
- Florida long-tailed weasel (*Mustela frenata peninsulae*)
- Southern fox squirrel (*Sciurus niger niger*)

Section 3: Species Assessments

Creating these assessments for locally important species on AWMA involved a number of steps. First, WCPR staff created a list of locally important species for the area, starting with the listed and recently delisted species in the 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 is lacking. In addition to the ISMP, references staff used when creating the list included: statewide potential habitat models created by FWRI using Cooperative Land Cover V.3.2, agency documents such as 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 July 18-19, 2018, at which area managers, species experts, and section leaders reviewed the draft species assessments and discussed AWMA'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 was finalized and implemented.

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: Frosted Flatwoods Salamander

Current Condition: The frosted flatwoods salamander is a federally-Threatened species that continues to experience population declines, making it a high priority for management. The major threat facing the species is habitat loss and degradation. There are no records of frosted flatwoods salamanders from AWMA; however, there are records from 1997 of 2 adults on Highway 59 near the area's western boundary. The closest population is on Flint Rock WMA where there are records of occupied wetlands less than 2 miles from AWMA's southern boundary.

Frosted flatwoods salamanders require continuous, herbaceous groundcover from the uplands through the ecotones and into wetland basins. Suitable upland habitat for this species consists of open-canopied pine flatwoods and savannas with diverse groundcover dominated by grasses, herbs, and forbs. Suitable breeding wetlands lack predatory fish; contain a high density and diversity of herbaceous vegetation, including rosette-forming herbs and bunch grasses; and contain low amounts of organic duff. Due to management prior to State acquisition, most of AWMA is not suitable for this species, but planned natural community restoration will improve conditions.

During 2009-2011, area staff used mechanical treatments to reduce the hardwood midstory in 96 wetlands as per recommendations in the 2009 Strategy. Even with these restoration actions, the majority of wetlands cannot currently support flatwoods salamanders due to the amount of duff as well as low densities of rosette-forming herbs and bunch grasses needed for nesting and larval habitat. Wetlands on AWMA that contain remnant breeding and larval habitat will receive priority for future restoration actions.

Habitat Management: In accordance with management recommendations for this species, staff plan to conduct frequent prescribed burns (every 1-3 years) in both upland and wetland habitat. When conditions are favorable, staff will conduct prescribed burns in late spring or early summer when wetlands are dry so that fire carries through the basins. Staff will continue avoiding firebreak placement along wetland ecotones because they can alter or destroy the herbaceous component preferred by this species and other amphibians, as well as prevent fire originating in the uplands from reaching the wetlands. If necessary, staff use wet-lining as an alternative to mineral firebreaks.

Staff will continue their efforts to reduce the hardwood midstory in the uplands surrounding potential breeding wetlands through a combination of mechanical treatments, chemical treatments, and prescribed fire. This includes prioritizing burn units containing wetlands and surrounding uplands with vegetation indicative of flatwoods salamander habitat for growing season burns.

A combination of mechanical treatments, herbicide treatments, and prescribed fire is necessary in overgrown sites where the use of fire alone is not effective. When staff use these methods, they will continue to take precautions to prevent soil rutting and overspray from herbicides that could damage desirable herbaceous vegetation.

Another potential source of rutting and damage to desirable vegetation is rooting by feral hogs. During 2008-2009, the Coastal Plains Institute conducted an inventory of wetlands on AWMA and found that 17% of inventoried wetlands had hog damage. Additionally, the Area Biologist has observed hog rooting in wetlands that received restoration treatments. If hog damage occurs in priority flatwoods salamander wetlands in the future, WHM staff will consult with species experts to explore control options for hogs.

Monitoring: Since the majority of habitat on AWMA is currently unsuitable for flatwoods salamanders, frequent monitoring of potential breeding sites is not necessary. Staff will survey potential breeding wetlands at least once during the 10-year lifetime of this Strategy but will consider targeting some wetlands for more frequent monitoring if there are indicators of suitable habitat (e.g., presence of indicator plant species plus low levels of duff, presence of other amphibian species known to be associated with flatwoods salamanders). Previous monitoring efforts focused on wetlands closest to the 1997 records, which are identified in FWC's 2005 report, "Management Recommendations for the Flatwoods Salamander on Aucilla Wildlife Management Area." During future monitoring efforts, staff will target other sites including the Pinhook Tract, which is closest to occupied sites on Flint Rock WMA, and use multiple survey methods to increase the chances of detecting the species. Acceptable methods include, but are not limited to, dip-netting potential breeding wetlands using WHM's [Standard Protocol for Ephemeral Wetland Dip-netting Surveys](#), using minnow traps in potential breeding wetlands, and using drift fence arrays near potential wetlands.

Species Management: Even when habitat is restored, salamanders might not colonize the area from Flint Rock WMA. Area staff and the Conservation Biologist will need to coordinate with species experts to develop a plan to reintroduce flatwoods salamanders to AWMA when wetland and upland habitat is suitable.

Area's Role: Given the amount of potential habitat available and nearby records of the species, it is reasonable to assume that AWMA once supported flatwoods salamanders and could do so again with continued management. Therefore, the role of AWMA in the conservation of the frosted flatwoods salamander is to eventually support a breeding population. Staff will achieve this role through restoration of flatwoods and embedded wetlands and reintroducing the species to the area when appropriate. Ongoing and planned efforts, including removing encroaching hardwoods from potential breeding sites to facilitate fire carrying through wetland basins and increasing the number of burns conducted during the growing season, will continue to improve habitat for this species.

AWMA staff currently coordinate with staff from TNC, Flint Rock WMA on prescribed burns and wetland restoration, and will continue these efforts in the future. While the current priority is to restore habitat on the FWC-lead portion of AWMA, FWC staff could assist SRWMD with surveys and habitat management for the salamander.

3.2: Barbour's Map Turtle and Suwannee Cooter

Current Condition: The Barbour's map turtle is State-designated Threatened. The Suwannee cooter is included in the ISMP as a species recently delisted by FWC. The SAPs for

the [Barbour's map turtle](#) and [Suwannee cooter](#) list AWMA as a conservation land inhabited by both species. The Suwannee cooter occurs throughout the Wacissa River, while there are only 3 records of the Barbour's map turtle from the Wacissa. A 2015 FWRI report summarized the results of Barbour's map turtle surveys, and recommends directing future survey efforts to the Wacissa.

Suwannee cooters forage on aquatic vegetation, while the diet of Barbour's map turtles consists primarily of mollusks and aquatic insects. Both species require basking sites in the form of snags or limestone rocks. For nesting, both species require well-drained soils that receive moderate sun exposure, usually no more than a few meters from the river floodplain. Rivers on AWMA provide ample foraging habitat, but neither staff nor experts know how much nesting habitat is available.

Habitat Management: Staff will continue following recommendations to maintain habitat for these species that include restoring natural hydrology, protecting water quality to prevent pollution and sedimentation, and avoiding removal of potential basking sites (e.g., snags and limestone rocks). Additionally, they will continue following SAP-recommended actions of using prescribed fire to prevent hardwood encroachment in nest sites and protecting known nest sites from disturbances such as off-road vehicles.

Monitoring: Staff will opportunistically document nests of both species. Additionally, staff will coordinate with experts to conduct a survey to determine the distribution and abundance of map turtles in the Wacissa River, following established protocol for single-pass basking surveys (identified as Objective 6.3.5 in [AWMA's Management Plan](#)).

Area's Role: The role of AWMA in the conservation of the Barbour's map turtle and Suwannee cooter is to provide suitable habitat to support the regional population. Staff will achieve this role by restoring natural hydrology to the extent feasible and following BMPs to protect water quality when conducting natural community restoration. Current and planned actions to restore natural communities on AWMA, including hydrologic restoration and prescribed fire are compatible with recommended management practices in the SAP. Additionally, these species benefit from the protections to water quality provided by AWMA and neighboring conservation lands.

3.3: Gopher Tortoise

Current Condition: The gopher tortoise is State-designated Threatened and a candidate for federal listing, making it a high statewide priority. Gopher tortoises occur at low densities on AWMA and staff have documented juveniles on the area. However, the alterations made to natural communities prior to State acquisition decreased the suitability of the area for this species. Planned restoration will improve conditions.

The 2009 WCPR Strategy listed conducting a baseline tortoise survey as an objective, and area staff contracted with FNAI to complete this monitoring in 2012. Using natural community and LIDAR elevation data to identify potential habitat, FNAI conducted a belt-transect survey in approximately 23% of the 1,510 acres identified as potential habitat. They documented a total of 13 adult-sized burrows (7 active, 2 inactive, 4 abandoned). The Calico

Hills region, located in the north-central portion of the WMA, contained the most burrows. Following completion of the transect survey, FNAI staff returned to burrows classified as active and inactive to determine occupancy with a burrow camera. FNAI located additional burrows during the scoping effort and recorded occupancy in 13 out of 17 scoped burrows.

In addition to the FNAI survey, AWMA staff surveyed approximately 100 acres of potential tortoise habitat in and west of the Calico Hills region during fiscal year 2017-18. Staff documented 72 total burrows (29 active, 16 inactive, 27 abandoned). The size classes for active and inactive burrows included 31 adults, 12 subadults, and 2 juveniles. Staff recorded 17 occupied out of 44 burrows scoped using a burrow camera (10 adults, 6 subadults, and 1 juvenile).

The consensus among species experts is that 250 acres of contiguous, suitable habitat is necessary to support a viable population of tortoises. Although the FNAI survey indicated that the northeastern and western habitat patches might have enough habitat to support populations with habitat restoration, the potential habitat within these patches is not contiguous, but interspersed with wetter natural community types that are not suitable for tortoises. For example, the largest habitat patch identified in the survey is in the northeast portion of the WMA and contains approximately 484 acres of potential tortoise habitat currently classified as restoration mesic flatwoods. However, most of this potential habitat does not have the depth to water table preferred by tortoises and has basin swamp interspersed within it. There is potential habitat on the eastern portion of the WMA that is managed by SRWMD, but the adjacent potential habitat on the FWC-managed portion floods seasonally.

Due to AWMA's wet soils and the lack of continuity between potential habitat, the area likely cannot support a viable population of tortoises on its own but can provide habitat to support the regional population. For example, since Avalon Plantation is a gopher tortoise recipient site, it is possible that tortoises could disperse from Avalon Plantation to the northern portion of AWMA. Currently, the Calico Hills region supports the greatest number of tortoises on AWMA. This habitat surrounds an inholding, which contains approximately 25 acres of potential tortoise habitat, according to species models. Therefore, there is an opportunity for WHM and Conservation Planning Services to coordinate with the landowner on habitat management for tortoises and other wildlife.

Habitat Management: The [FWC Gopher Tortoise Management Plan](#) outlines actions to improve the status of the species. The plan recommends managing potential tortoise habitat to achieve the conditions identified for FNAI reference sites, primarily with prescribed fire. The recommended fire return interval for mesic flatwoods is 1-3 years, and this is the planned management approach on AWMA. Additionally, the plan recommends actions 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 continue to conduct mechanical treatments that use heavy equipment (e.g., roller chopping, timber harvesting) during the winter in sites where tortoises occur. Conducting activities during the

winter will allow staff 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, while planning management activities, staff will continue to 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. Contractors will be directed to take precautions for tortoises and tortoise burrows while conducting mechanical treatments.

Monitoring: Staff will continue to opportunistically document observations of tortoise burrows and juvenile tortoises. Additionally, staff will continue to document and flag burrows prior to heavy mechanical treatments. In the future, as habitat improves with management, staff will evaluate the need for another survey of potential habitat, especially if observations of tortoises and burrows become more frequent.

Area's Role: The role of AWMA in the conservation of the gopher tortoise is to provide suitable habitat to support the regional population. Staff will achieve this role by continuing to restore mesic flatwoods through prescribed burns on a ≤ 3 year rotation, timber harvests to thin pine plantations, and mechanical and chemical treatments to reduce hardwood midstory, while also following management recommendations to protect the species.

AWMA staff currently coordinate with staff from TNC-Flint Rock WMA on prescribed burns and will continue these efforts in the future. While the current priority is to restore habitat on the FWC-lead portion of AWMA, FWC staff could assist SRWMD with surveys and habitat management for the tortoise.

3.4: Bachman's Sparrow

Current Condition: The Bachman's sparrow is recognized as an 'indicator species' whose continued presence indicates well-managed pine communities that contain a healthy herbaceous component important for many wildlife species. Since 2011, AWMA staff have conducted avian point counts annually at 91 stations. During these surveys, staff documented Bachman's sparrows in 2017 and 2018 at a station located in the northeast portion of the WMA. These are the only records of Bachman's sparrows on the area. In conjunction with the 2018 avian survey, staff used audio recordings at stations that appeared to have suitable habitat but did not detect the species at any additional stations. Regionally, there are few [eBird.org](https://ebird.org) records near AWMA; the closest is from 2017 and located approximately 2 miles north of AWMA on State Road 59. Avalon Plantation likely contains high quality, occupied habitat that is close enough to AWMA for Bachman's sparrows to disperse between the properties.

The Bachman's sparrow is a 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 since it spends most of its time on the ground. Potential habitat for Bachman's sparrows on AWMA consists of mesic flatwoods and pine plantations that were historically mesic flatwoods. Much of the habitat is currently not suitable for the species due to dense shrubs and limited herbaceous cover but will improve with continued restoration.

Habitat Management: Frequent (≤ 3 -year rotation) prescribed fire improves habitat quality for Bachman's sparrows, and staff on AWMA will continue to use prescribed fire at this frequency to restore and maintain habitat for the species. The occurrence of 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, managers will retain some small patches of shrubs during mechanical treatments. Staff will continue to follow mechanical treatments with a prescribed burn to stimulate growth of grasses and forbs.

Monitoring: Since the Bachman's sparrow can serve as a habitat indicator, monitoring will help gauge the effectiveness of restoration efforts. Trends in distribution and relative abundance are expected to increase over time as habitat improves. Although Bachman's sparrows have been documented on the area, they have not been documented at a high enough occupancy to warrant call-back monitoring, but there may be an opportunity to do so in the future. Staff will continue to conduct avian point counts at the recommended interval and record sparrow sightings until they occur at a density at which experts agree that callback monitoring is an appropriate method of tracking habitat management.

Area's Role: The role of AWMA in the conservation of the Bachman's sparrow is to provide suitable habitat to support the regional population. Staff will fulfill this role by continuing to restore flatwoods communities through prescribed fire on a ≤ 3 -year rotation, timber harvests to thin pine plantations, and mechanical and chemical treatments to reduce hardwood midstory and excessive shrubs.

3.5: Bald Eagle

Current Condition: While no longer a listed species, the bald eagle is protected at the federal level under the Bald and Golden Eagle Protection Act, and at the State level by species-specific rule. In 2017, FWC approved the [Species Action Plan for the Bald Eagle](#) to maintain or improve the species' conservation status so it will not need to be listed again in Florida. As detailed in the SAP, FWC identified 23 areas of concentrated eagle nesting – referred to as cluster nesting areas – that annually produce an estimated 65% of the known young in the state. AWMA is near a nest cluster along the coast that includes St. Marks National Wildlife Refuge (NWR), indicating the presence of high-quality breeding and foraging habitat near the WMA.

Eagles use a variety of natural communities with the best nesting habitat occurring in forested areas close to open water. Most of the potential habitat on AWMA is located along the Wacissa River. Currently, there are 2 active nests on AWMA and 1 on adjacent property that area staff annually monitor through aerial surveys.

Habitat Management: When conducting land management activities within 660-ft of known eagle nests, staff will continue to follow [eagle nest protection guidelines](#) to the greatest degree practicable. Eagles will benefit from current and planned actions to restore natural communities. Timber management for mature stands and the retention of large, old trees on the

landscape will provide potential nest trees. Following BMPs that protect water quality while conducting natural community restoration will protect foraging habitat.

Monitoring: Staff will continue conducting aerial surveys to document the location of nests so that they can be protected during management activities. If a nest has been destroyed, staff will attempt to locate and document the new nest. Surveys should occur at least every 3 years but can be conducted more frequently at the discretion of the Area Biologist. Annually, WCPR will report nest observations to baldeagle@myfwc.com during regular data exchanges to ensure the nests are included in the statewide database.

Area's Role: The role of AWMA in the conservation of the bald eagle is to provide suitable habitat to support the regional population. By restoring natural communities, following BMPs to protect water quality, and protecting nests during management activities, AWMA staff will achieve the area's conservation role for eagles. Bald eagles will likely persist on AWMA due to the area's proximity to a cluster nesting area and large water bodies.

3.6: Limpkin

Current Condition: The limpkin is included in the ISMP as a species recently delisted and the FWC drafted the [Limpkin SAP](#) to ensure the species doesn't warrant relisting in the future. Limpkins are common on the Wacissa River within AWMA and staff have documented breeding. The 2009 WCPR Strategy included a recommendation to monitor limpkins due to concerns at that time over the species' disappearance from Wakulla Springs State Park. Since 2012, AWMA staff have conducted annual limpkin surveys along the Wacissa River using a protocol adapted from the [North American Marsh Bird Monitoring Program](#). Results of this monitoring show no indication of a decline in the number of limpkins using the area.

Habitat Management: Limpkins can inhabit a variety of aquatic communities but are restricted to sites with apple snails, which are their primary food. Management actions that maintain habitat for limpkins that staff apply on AWMA include restoring natural hydrology, following BMPs to protect water quality and prevent pollution, and treating invasive aquatic plants. Staff will continue to avoid management activities that could disturb nesting limpkins (e.g., mechanical and chemical treatments of aquatic vegetation near known nest sites) and avoid damaging vegetation in which birds construct their nests.

Monitoring: Results from surveys conducted on AWMA may inform future work to accomplish actions identified in the SAP; therefore, it is important to share results of monitoring with species experts. Since one of the actions in the SAP is to implement a statewide monitoring program for limpkins, coordination with species experts is needed to determine if limpkin monitoring by AWMA staff is necessary, and if so, to ensure any monitoring on the area is compatible with monitoring at the statewide level. For these reasons, we identified the following objective related to monitoring:

Objective 1: By 2022, summarize the results of limpkin monitoring in a report and share with FWC species experts to determine if monitoring by area staff is still necessary and, if so, how the protocol should be modified to align with statewide monitoring efforts.

Staff will continue monitoring limpkins using the current protocol until the above objective is met, at the discretion of the Area Biologist.

Area's Role: The role of AWMA in the conservation of the limpkin is to provide suitable habitat to support the regional population. Staff will achieve this role by restoring natural hydrology to the extent feasible and following BMPs to protect water quality while conducting natural community restoration. Additionally, limpkins using the area will benefit from the protections to water quality provided by AWMA and neighboring conservation lands.

3.7: Red-cockaded Woodpecker

Current Condition: The red-cockaded woodpecker is a federally-Endangered species, making it a high statewide priority for management. There is a historic red-cockaded woodpecker cluster in the northwestern portion of AWMA, but there have been no observations on the area since the 1980s. The nearest active clusters are approximately 4 miles northeast on Avalon Plantation and approximately 5 miles south on St. Marks NWR. The [USFWS Recovery Plan](#) for this species includes St. Marks NWR in the Central Florida Panhandle primary core population, and designates Avalon Plantation as a significant support population. The population goals stated in the Recovery Plan for St. Marks NWR and Avalon Plantation are 71 and ≥ 25 active clusters, respectively.

Red-cockaded woodpeckers inhabit open, mature pine woodlands with a diversity of grasses, forbs, and shrubs. As primary cavity nesters, individuals excavate their own cavity in the heartwood of older (typically >60 years) living pines. Suitable cavities and potential cavity trees are often the limiting factor for this species.

According to a timber inventory completed in 2014, the age of slash and loblolly plantations on AWMA ranges from 20-45 years. Stands closest to Avalon Plantation are 33-36 years old and stands closest to St. Marks are 30-34 years old. AWMA cannot currently support red-cockaded woodpecker clusters due to the age of the trees and hardwood midstory. However, some sites on the area may currently be suitable as foraging habitat for woodpeckers dispersing from neighboring conservation lands.

Habitat Management: Staff will continue to retain large, old pines on the landscape as potential woodpecker cavity trees. They will also continue current and planned actions to restore mesic and wet flatwoods, including timber management for mature stands, chemical and mechanical treatments to reduce midstory shrubs, frequent prescribed fire, and future establishment of longleaf pine.

Monitoring: Staff will opportunistically monitor for red-cockaded woodpeckers and inform FWC's Avian Conservation Coordinator if the species is detected on the area. AWMA staff will coordinate with staff from St. Marks NWR and Avalon Plantation to determine the origin of any banded birds observed. If red-cockaded woodpeckers are documented on the area, staff will search for and mark any cavity trees and ensure that they are protected during management activities according to guidelines in the Recovery Plan. Staff will fulfill the area's role through continued natural community restoration and by implementing the following objective:

Objective 1: Over the 10-year lifetime of this Strategy, interact with species experts to determine the feasibility and timeframe for installing recruitment clusters in the northern and southern portions of the WMA to provide potential cavities for red-cockaded woodpeckers dispersing from Avalon Plantation and St. Marks NWR. Developing a timeframe should take into account the rate of tree growth in suitable stands, determined via timber assessments, applicable guidelines in the Recovery Plan, and natural community restoration goals.

Area's Role: Due to AWMA's location between 2 red-cockaded woodpecker populations, the area could potentially provide habitat for red-cockaded woodpeckers dispersing from both the north and south. Therefore, the role of AWMA in the conservation of the red-cockaded woodpecker is to provide suitable habitat that has the potential to link red-cockaded woodpecker populations on St. Marks NWR and Avalon Plantation. AWMA staff currently coordinate with staff from TNC-Flint Rock WMA on prescribed burns and wetland restoration and will continue these efforts in the future.

3.8: Wading Birds

Current Condition: This WMA supports two river systems and many wetlands that provide significant potential for these species, and as altered acres are restored, the potential will improve. AWMA staff annually conduct aerial surveys to monitor the status of known wading bird colonies, as well as to document new colonies. Staff have documented a total of 7 colony locations on the area, though the number of colonies that are active varies from year to year. Of the species addressed in [FWC's Species Action Plan for Six Imperiled Wading Birds](#), staff have observed the little blue heron (*Egretta caerulea*) and snowy egret (*Egretta thula*) nesting on the area, and the tricolored heron (*Egretta tricolor*) and white ibis (*Eudocimus albus*) foraging on the area. Additionally, staff have observed the federally-Threatened wood stork (*Mycteria americana*) foraging on the area.

Habitat Management: Staff will conduct natural community management following wildlife BMPs to benefit these species. However, it is possible that management actions (e.g., prescribed fire, timber harvest) could have negative impacts on wading birds if these activities disturb birds while they are nesting or reduce the suitability of nest sites. Therefore, if staff need to conduct mechanical and chemical treatments near colonies, actions will be planned to occur during the non-breeding season and efforts made to avoid damaging the vegetation in which the birds construct their nests. If it is not possible to accomplish management activities when a colony is inactive, staff will maintain a 330-ft buffer around active colonies to protect them from disturbance.

Monitoring: AWMA staff previously attempted to monitor known wading bird colonies from the ground but found the method to be too time consuming as well as disruptive to the birds. Therefore, staff will continue conducting annual aerial surveys to monitor the status of colonies and identify areas that should be protected during land management activities. FWC species experts are developing a statewide database for wading bird data according to Action 25 of the SAP. Continued monitoring and reporting of new colonies on AWMA will support this action.

Area's Role: The role of AWMA in the conservation of wading birds is to provide suitable breeding and foraging habitat to support the regional population. Staff will achieve this role by maintaining and restoring natural communities while protecting nesting sites. Current and planned actions to restore natural communities, including hydrologic restoration, exotic plant control, and prescribed fire, are compatible with recommended management practices in the SAP. Additionally, wading birds using the area will benefit from the protections to water quality provided by AWMA and neighboring conservation lands.

3.9: Florida Black Bear

Current Condition: According to [FWC's Black Bear Management Plan](#), AWMA is located within the East Panhandle Bear Management Unit (BMU) and bears on the area are part of the Apalachicola subpopulation. Bears are common on AWMA and most of the area is bear habitat. During 2014-2015, FWRI conducted a statewide study to estimate bear abundance and density, including AWMA as a sampling site. The population estimate for bears in the BMU is above the minimum objective for the subpopulation (570 bears; the population estimate in 2015 was 1,060 bears). Therefore, the Bear Management Plan objective for the BMU is to maintain the current subpopulation.

The Bear Management Plan also discusses AWMA's significance as a corridor for population expansion to the east, stating, "continuing to manage St. Marks NWR and Aucilla WMA to provide bear habitat would help support bear numbers for expansion into the Big Bend Bear Management Unit."

Habitat Management: Bears require a mosaic of natural communities and vegetation structure. Efforts to restore natural communities on the area to a more open landscape with reduced tree density, lower shrub height, and reduced shrub cover may reduce denning and escape cover for bears. However, these efforts will also increase availability of forage such as berries and tubers. Additionally, significant acres of floodplain forest and other communities that do not require fire will continue to exist on AWMA and will continue to provide for the needs of bears. To promote mosaic conditions, staff will plan to conduct some burns under higher humidity or with higher fuel moisture. Staff will also continue to avoid "burning out" patches of vegetation that remain after an initial fire and forcing fire into fire shadows. In dense, shrubby vegetation that could be a den, staff will exercise caution if conducting mechanical treatments or burning from January-April. Staff will continue to secure garbage and other attractants at field offices and recreation areas.

Monitoring: Because FWRI monitors this species, monitoring by AWMA staff is not necessary. Staff will participate in statewide monitoring efforts as needed and as work schedules allow.

Area's Role: The role of AWMA in the conservation of the Florida black bear is to provide suitable habitat to support the Apalachicola subpopulation and allow population expansion into the Big Bend BMU. By conducting management that provides a variety of forage types and cover, AWMA staff will continue to provide habitat for bears. Bears will likely persist

on AWMA due to the area's diversity of natural communities and connectivity to other conservation lands.

Section 4: Beyond the Boundaries Coordination and Considerations

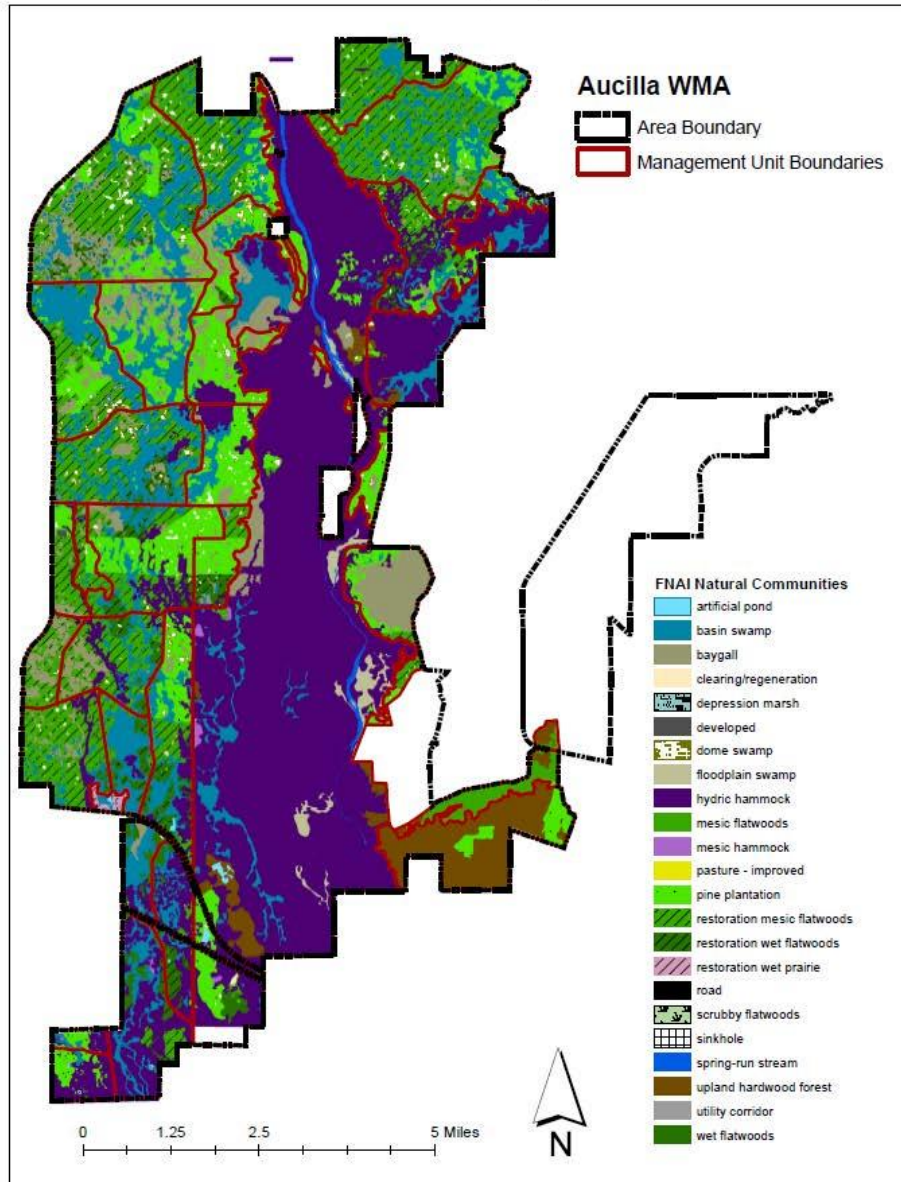
As discussed in the above assessments, several locally important species could potentially disperse between AWMA and neighboring conservation lands. While AWMA and the current condition and management of neighboring lands provides an opportunity to further the conservation of many locally important species, significant changes in management or land use beyond the boundaries may have 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. As such, the actions of adjacent landowners will determine if some of these focal species persist on AWMA. Area staff should continue to have cordial relationships with adjacent landowners and provide input or technical assistance with wildlife management if requested. Landowners interested in cooperating with conservation of focal species should be encouraged to establish communication with the Office of Conservation Planning Services. Additionally, as several locally important species have potential habitat on the SRWMD-lead portion of AWMA, staff should continue interacting with SJWMD on land management issues.

Table 1. Acres of current and estimate of historic natural communities on AWMA as determined by the Florida Natural Areas Inventory (FNAI).

FNAI Natural Community	Current Acres	Historic Acres
artificial pond	65.1	0
basin marsh	0	731.2
basin swamp	7,305.0	4,846.8
baygall	3,443.3	2,791.1
clearing/regeneration	12.5	0
depression marsh	39.3	185.8
developed	11.9	0
dome swamp	893.9	1,315.2
floodplain swamp	380.3	601.9
hydric hammock	16,765.7	16,640.8
mesic flatwoods	447.2	9,898.0
mesic hammock	72.3	201.9
pasture - improved	4.0	0
pine plantation	5,236.3	0
restoration mesic flatwoods	7,043.6	0
restoration wet flatwoods	1,138.3	0
restoration wet prairie	40.9	0
road	37.6	0
ruderal	0	25.0
scrubby flatwoods	2.5	22.9
sinkhole (historically river floodplain lake)	0.6	0.6
spring-run stream	256.4	265.3
strand swamp	0	118.3
upland hardwood forest	1,763.4	2,927.6
utility corridor	34.3	0
wet flatwoods	303.6	4,619.1
wet prairie	0	264.8
Total ¹	45,297.8	45,456.3

¹ Total acres differ between current and historic due to minor differences in boundaries at time of mapping, and due to round off error.

Appendix 1. AWMA current natural community map.



Appendix 2. AWMA locally important species.

<u>Species</u>	<u>Location in Document</u>
Alligator snapping turtle (<i>Macrochelys apalachicola</i>)	Document Occurrence
Black rail (<i>Laterallus jamaicensis</i>)	Document Occurrence
Bachman's sparrow (<i>Peucaea aestivalis</i>)	Species Assessments
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Species Assessments
Barbour's map turtle (<i>Graptemys barbouri</i>)	Species Assessments
Big Blue Springs cave crayfish (<i>Procambarus horsti</i>)	Historic, Current, and Planned Management
Eastern diamondback rattlesnake (<i>Crotalus adamanteus</i>)	Document Occurrence
Eastern indigo snake (<i>Drymarchon couperi</i>)	Document Occurrence
Eastern king snake (<i>Lampropeltis getula</i>)	Document Occurrence
Eastern spotted skunk (<i>Spilogale putorius</i>)	Document Occurrence
Florida black bear (<i>Ursus americanus floridanus</i>)	Species Assessments
Florida long-tailed weasel (<i>Mustela frenata peninsulae</i>)	Document Occurrence
Frosted flatwoods salamander (<i>Ambystoma cingulatum</i>)	Species Assessments
Gopher tortoise (<i>Gopherus polyphemus</i>)	Species Assessments
Limpkin (<i>Aramus guarauna</i>)	Species Assessments
Ornate chorus frog (<i>Pseudacris ornata</i>)	Document Occurrence
Rafinesque's big-eared bat (<i>Corynorhinus rafinesquii</i>)	Inventories
Red-cockaded woodpecker (<i>Picoides borealis</i>)	Species Assessments
Southern fox squirrel (<i>Sciurus niger niger</i>)	Document Occurrence
Spotted turtle (<i>Clemmys guttata</i>)	Document Occurrence
Suwannee cooter (<i>Pseudemys concinna suwanniensis</i>)	Species Assessments
Tricolored bat (<i>Perimyotis subflavus</i>)	Inventories
Wading birds (multiple species)	Species Assessments

11.16 Hydrological Assessment

**HYDROLOGY ASSESSMENT AND
RESTORATION PLAN
FOR THE AUCILLA WILDLIFE
MANAGEMENT AREA**

**Aucilla Wildlife Management Area
State Road 59 and Highway 98
Jefferson and Taylor Counties, Florida
WRS Project No. 305600**

**Submitted to:
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1.0 INTRODUCTION

1.1 Purpose

WRS Infrastructure & Environment, Inc. (WRS) was authorized by the Florida Fish and Wildlife Conservation Commission (FFWCC) under Contract Number S7701623587 to perform a hydrology assessment and produce a hydrology restoration plan for the Aucilla Wildlife Management Area (AWMA) located at State Road 59 and Highway 91 in Jefferson and Taylor Counties, Florida. The objective of this hydrology assessment and hydrology restoration plan are to provide site-specific information regarding the historical drainage pathways, drainage divide locations, current drainage pathways, existing drainage structures, and proposed drainage structures.

1.2 Site Setting

The AWMA is located between State Road 259 and Highway 98 in Jefferson and Taylor Counties, Florida. The total area of the AWMA covers approximately 48,783 acres. The study area covers 42,462 acres of the AWMA. The AWMA falls within the Cody, Lamont, Nutall Rise, Saint Marks, and Wacissa 7.5-minute topographic quadrangle maps (United States Geologic Survey [USGS]). The location of the study area in reference to the surrounding regional area is illustrated in Figure 1.

The property is surrounded to the north by the small, rural communities of Limestone, Wacissa, and Thomas City and to the west by the small, rural community of Fanlew. The Saint Marks National Wildlife Refuge borders the property to the south. Two large quarries and the small, rural community of Nutall Rise are located to the southeast of the site. The Three Rivers Hunt Club, a privately owned hunting reserve, owns the property adjacent to the eastern boundary of the AWMA.

1.3 Summary of Site Activities

In order to assess the historical and current drainage patterns and produce a hydrology restoration plan, the following tasks were performed:

- Historical aerial photography and topographic maps dating from the pre-pine plantation period were scanned and georeferenced.
- Historical drainage patterns were delineated using historical topographic maps and historical aerial photography.
- WRS personnel conducted on-site surveys to confirm location and status of existing structures, define flow directions, and locate previously unidentified structures.
- Restoration structures (culverts, low water crossings, ditch plugs) are recommended and prioritized according to degree of area restored.
- Six populated shape files with metadata and associated Tables were produced:
 - Basin and subbasin delineation (polygon) – Table 1
 - Natural drainage way and flow direction (line) – Table 2
 - Current ditches and flow direction (line) – Table 3
 - Historic flows (line)
 - Existing water control structures (point) – Table 4 and Table 5
 - Recommended water control structures (point) – Table 6

2.0 STUDY AREA TOPOGRAPHY, DRAINAGE, AND SUBBASIN DELINEATION

2.1 Topography

The topography of the study area is generally flat. The average gradient from the northern boundary of the study area to the southern boundary of the study area is 0.0056 inches declination per foot. The study area is characterized by hummocky topography. Local differences in elevation are associated with sinkholes, sinkhole lakes, solution valleys, springs, and disappearing streams. According to the soil surveys of Jefferson (1989) and Taylor (2001) Counties, the soils in the area are characterized as generally poorly drained, sandy soils to mucks, reflecting the shallow relief of the area.

2.2 Drainage

In the western portion of the study area, longitudinal ridges paralleling the Wacissa River, such as Calico Hill and Toolles Hammock, prevent direct drainage into the Wacissa River. Secondary drainage channels send flow due south. Due to the minimal relief in the area, there are no strong drainage divides. Drainage is primarily to Gum Creek, Hosford Branch, and the Western Sloughs.

In the northeastern portion of the study area, several tributaries drain directly to the Wacissa River. However, it appears that drainage channels in this area are not continuous. Depending on rainfall, flow stalls and drains to the groundwater system ultimately feeding the springs and sinkhole lakes.

All roads through the study area are unpaved. On the western side of the study area, road elevations are above surrounding grade. These roads appear to have been constructed from fill dredged along the roadside, forming deep ditches. Observed road maintenance includes grading and scraping the road surface and the removed material is piled along the roadside. Washouts, defined in a previous survey as places where the muck soil has been eroded by vehicle tires, were frequent and often impassable during periods of frequent rainfall.

Current drainage structures include culverts, low-water crossings, and bridges. Culverts ranged in size from 1 foot (ft) inner diameter (ID) to 3.5 ft ID and were composed of concrete or corrugated metal. Low-water crossings, defined as lower-elevation places in the road (generally covered with some cobbles or, in a few cases, gravel) where water could potentially flow across the road, were also common. Low-water crossings may appear similar to washouts, in some cases. Low-water crossings, however, are deliberately constructed within the roadway, unlike washouts formed through erosion and overuse.

Roadways and associated ditches are the primary barriers to the restoration of the historical flow regime in the study area. The roadways tend to be elevated above the surrounding grade, preventing flow across the roadways. Additionally, roadways are flanked by generally deep ditches. These ditches are likely to intersect the water table. As a result, they facilitate and accelerate drainage of historically poorly-drained areas.

In general, it was observed that surface water pooled in the northern ditches on east-west trending roads. Water appeared to pool and flow south along both ditches on located along north-south trending roads. All observed ditches facilitated accelerated drainage, preventing the development of saturated soils on which wetland vegetation communities develop.

2.3 Basin Delineation

The study area lies within the Aucilla Watershed (USGS Hydrologic Cataloging Unit 03110103). The term watershed is synonymous with basin. A drainage basin is defined as a region or area bounded by a drainage divide and occupied by a drainage system. Typically, this drainage system will be a surface stream or river, although that is not always the case within the study area. Drainage basins tend to cover large areas and flow within the area is typically controlled by topography.

As a result of their size, basins are frequently divided into subbasins. According to information provided in the Florida Geographic Data Library (FGDL), the Aucilla Watershed has been subdivided into subbasins. This existing subbasin information, along with review of topographic features and surface water flow information (topographically inferred and field observed), was used to delineate subbasins in the study area. The following eleven (11) subbasins were determined to lie within or intersect the AWMA: Hosford Branch Reach, West Wacissa River, Northeast Wacissa River, Southeast Wacissa River, Little River, Welaunee Creek, Cow Creek, Intermediary Subbasin, Aucilla River, Pinhook River, and a subbasin that drains directly into Apalachee Bay. Although the FDGL divides the West Wacissa River into two separate subbasins (the Wacissa River and the Slave Canal), this division did not meet our subbasin criteria and was not relevant to the purposes of this study. All other subbasins defined in this study are similar to and named the same as those found in the FDGL. A list of the identified Subbasins is provided in Table 1.

3.0 CURRENT DRAINAGE PATTERNS AND RECOMMENDATIONS

FFWCC provided WRS with Geographic Information System (GIS) data layers detailing culverts, bridges, low-water crossings, washouts, and AWMA boundaries. WRS personnel mobilized to the site to perform the on-site survey. During the on-site survey, WRS personnel confirmed the location and classification of the points on the previous survey. A TDS Ranger mobile data collection device equipped with an Invicta 210 differentially-corrected Global Position System (GPS) receiver was used to collect field data. Structure type, flow direction, condition (good, fair, poor), and comments were recorded in Tables 4 and 5. This information is also included as attributes associated with each shape file.

In the office, historical (circa 1950) topographic maps and aerial photographs were utilized to produce historical drainage maps. Drainage flow lines were drawn to topographic contour lines so that “V” pointed upstream and were drawn through the center of wetlands. The vegetation patterns coinciding with drainage channels seen from the roadways were used throughout the current aerial photography to delineate the more remote channels.

The following paragraphs discuss each of the eleven subbasins, describing the field-verified structures and as well as recommendations for new structures. Some existing structures identified in the information provided by the FFWCC were not located (Table 5). Instances where these structures could not be located are also discussed below. Due to the size of the study area, the township, section, and range were used to describe locations of existing structures as well as the recommended structures within each subbasin. The proposed control structures are shown in Figure 2 and Table 6.

3.1 Pinhook River Subbasin

The AWMA encompasses approximately 1,046 acres of the Pinhook River Subbasin. Overall drainage direction is to the southeast. Landmark identified two (2) culverts, seven (7) low water crossings, and seven (7) washouts in this subbasin. WRS personnel confirmed the presence of these structures as well as identified three (3) additional low water crossings, two (2) impassable areas, and one (1) washout. This access road is the predominant feature changing flow; water ponds along the north side of the road and flows through eroded drainage channels at the northern and southern termini of the road. WRS recommends three culverts and one ditch plug along the power line access road in study areas 04S03E11 and 04S03E02. WRS does not recommend the removal of any structures in this subbasin.

3.2 Aucilla River Subbasin

The AWMA encompasses approximately 4,159 acres of the Aucilla River Subbasin. Overall drainage direction is to the southwest. The area is characterized by limestone outcrops, exposures, sinkholes, and sandy deposits. Landmark identified one (1) culvert, three (3) low water crossings, four (4) bridges, and thirty-seven (37) washouts in this subbasin. WRS personnel confirmed the presence of these structures. Additionally, WRS personnel located one (1) culvert near the boundary of the property and two (2) natural sinkholes. WRS does not recommend any additional structures in this subbasin. Because the road design in this area does not include deep roadside ditches, the roads are not a major impediment to natural flow. While not a priority for reconnecting former drainages, WRS recommends the improvement of existing

washouts to hard-bottom low water crossings to maintain road functionality. WRS recommends the removal of the bridge along the northern boundary of the AWMA property (as indicated in study area 03S04E29). This bridge does not span a drainage channel and opens the AWMA to potential unwanted liabilities.

3.3 Intermediary Subbasin

The Intermediary Subbasin is characterized by disorganized overland flow. There are no distinct stream channels in this subbasin. The AWMA encompasses approximately 547 acres of the Intermediary Subbasin. Overall drainage direction is to the southwest. Landmark identified one (1) bridge, three (3) low water crossings, and ten (10) washouts in this subbasin. WRS personnel confirmed the presence of all but two of these structures. No additional structures were identified. While not a priority for reconnecting former drainages, WRS recommends the improvement of these washouts to hard-bottom low water crossings to maintain road functionality. No additional structures are required for drainage restoration.

3.4 Cow Creek Subbasin

As the name implies, Cow Creek Subbasin denotes the catchment of Cow Creek. The AWMA encompasses approximately 1,777 acres of the Cow Creek Subbasin. Overall drainage direction is to the southwest. Landmark identified two (2) culverts, two (2) bridges, three (3) low water crossings, and seven (7) washouts in this subbasin. WRS personnel confirmed the presence of all but one of these structures. The bridge located in study area 03S04E30 could not be located and is believed destroyed (a large plank was found in the vicinity). WRS also identified four (4) additional low water crossings. WRS recommends two culverts along the lateral access road crossing Cow Creek in study area 03S04E17 to eliminate ponding on the north side of the road. WRS does not recommend the removal of any structures in this subbasin.

3.5 Southeast Wacissa River Subbasin

The Southeast Wacissa River Subbasin is characterized by ephemeral flow. There are no distinct stream channels in this subbasin. The AWMA encompasses approximately 2,541 acres of the Southeast Wacissa River Subbasin. Overall drainage direction is to the southwest. Landmark identified seven (7) culverts, two (2) low water crossing, two (2) bridges, and fifteen (15) washouts in this subbasin. WRS personnel confirmed the presence most of these structures as well as identified one (1) additional culvert and four (4) low water crossings. WRS recommends one (1) culvert in the southeast portion of the basin (study area 03S04E19) to reconnect a portion of frequently flooded Nutall-Tooles fine sands at a road crossing. Structure removal is not recommended in this subbasin.

3.6 Welaunnee Creek Basin

As the name implies, Welaunnee Creek Subbasin denotes the catchment of Welaunnee Creek. The AWMA encompasses approximately 1,980 acres of the Welaunnee Creek Subbasin. Overall drainage direction is to the southwest. Landmark identified seven (7) culverts and three (3) washouts in this subbasin. WRS personnel confirmed the presence of these structures as well as identified one (1) additional culvert, one (1) impassable areas, and one (1) drainage way. WRS recommends two hard-bottom low water crossing structures along the northeast boundary of the AWMA property to reconnect drainage of the depressional Tooles/Chaires fine sands. Road

lengths were minimal in this subbasin. WRS does not recommend the removal of any structures in this subbasin.

3.7 Northeast Wacissa River Subbasin

The AWMA encompasses approximately 5,880 acres of the Northeast Wacissa River Subbasin. Overall drainage direction is to the southwest. Landmark identified one (1) bridge, eight (8) culverts, seventeen (17) low water crossings, and six (6) washouts in this subbasin. WRS personnel confirmed the presence of these structures as well as identified four (4) additional culverts, three (3) impassable areas, and thirteen (13) low water crossings. WRS recommends seven (7) hard-bottom low water crossing structures in the northeastern portion of the AWMA property to reconnect drainage of the Surrency fine sands where crossed by roads. In addition, WRS recommends the eventual conversion of all noted washouts and impassable areas to hard-bottom low water crossings in order to preserve drainage while ensuring vehicle access. WRS does not recommend the removal of any structures in this subbasin.

3.8 Little River Subbasin

The AWMA encompasses approximately 99 acres of the Little River Subbasin. Overall drainage direction is to the southwest. Landmark did not identify any structures in the AWMA-portion of this basin. WRS also did not locate any structures in this portion of the AWMA. Because no roads traverse this area and natural flow appears undisturbed, addition or removal of structures is not recommended in this subbasin.

3.9 West Wacissa River Subbasin

The AWMA encompasses approximately 14,893 acres of the Western Wacissa River Subbasin. Overall drainage direction is to the south. Landmark identified twenty-nine (29) culverts, eighteen (18) low water crossings, three (3) bridges, and forty-four (44) washouts in this subbasin. WRS personnel confirmed the presence of most of these structures as well as identified twelve (12) additional culverts, two (2) impassable areas, and three (3) low water crossings. In the northern portion of the basin, WRS recommends six (6) hard-bottom low water crossing structures to reconnect Surrency fine sands where crossed by roads. In the southern half of the basin, WRS recommends the installation of five (5) culverts. The recommended culvert in study area 03S03E02 will better manage drainage than the washout currently mapped. The remaining recommended culverts are intended to facilitate flow of water, which currently stagnates north the Western Sloughs access road. Three ditch plugs are recommended along the main longitudinal road east of the Western Sloughs. Currently, the ditches alongside this road act as a conduit for unnaturally rapid flow. These ditch plugs do not require any additional structures prior to emplacement. The ditch plug suggested in study area 04S03E01 is designed to prevent water from the Western Sloughs from being diverted out of the basin by flowing along the road. The four associated culverts should be installed prior to installation of the aforementioned ditch plug.

3.10 Hosford Branch Reach Subbasin

The AWMA encompasses approximately 13,298 acres of the Hosford Branch Reach Subbasin. Overall drainage direction is to the south. Landmark identified fifty-eight (58) culverts, thirty-two (32) low water crossings, and eleven (11) washouts in this subbasin. WRS personnel

confirmed the presence of these structures as well as identified twenty-five (25) additional culverts, three (3) impassable areas, three (3) low water crossings, and one (1) bridge. WRS recommends twenty (20) hard-bottom low water crossing structures in the northern portion of the AWMA property to reconnect drainage of the depressional Tooles/Chaires fine sands and Surrency fine sands. In the southern half of the basin, WRS recommends thirty-two culverts to reconnect the sand deposits mentioned above. WRS recommends culverts over low water crossings because of the larger volume of water moving through the area. After emplacement of these culverts, WRS recommends numerous ditch plugs along the longitudinal roads in the southern portion of the basin in order to restore the natural ponding tendency over these sands. The ditches along these longitudinal roads concentrate runoff and facilitate rapid drainage due to their orientation in the preferred drainage direction. WRS does not recommend the removal of any structures in this subbasin.

3.11 Direct Runoff to Bay Subbasin

The AWMA encompasses approximately 756 acres of the Direct Runoff to Bay Subbasin. Overall drainage direction is to the south. Landmark identified one (1) culvert and one (1) washout in this subbasin. WRS personnel confirmed the presence of these structures as well as identified six (6) additional culverts and one (1) impassable area. WRS recommends two ditch plugs in study area 03S03E21 to facilitate ponding and enhance wetland vegetative communities. WRS does not recommend the removal of any structures in this subbasin.

4.0 CONCLUSIONS

It is evident from review of the pre-pine plantation photographs, topography, and soil types that the AWMA was historically a poorly drained wetland area. Pine plantation and road building activities significantly disturbed this wetland environment by increasing drainage rates and changing drainage flow directions. In order to restore historic flow, WRS recommends that all washouts be upgraded to hard bottom low water crossings. During construction of these low water crossings, care should be taken to bevel the road edges so that water can flow across the road as designed. This is particularly important during road improvement (grading) activities. Additionally, numerous ditch plugs have been recommended to prevent rapid-drainage of the area and to restore wetland habitat. Specific ditch plug locations were discussed in the earlier paragraphs and are shown on Figure 2. Because the primary drainage direction is from north to south, ditch plugs should be prioritized along north-south roads over east-west roads.

5.0 REFERENCES

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- St. Marks NE, FLA. 7.5 Minute Series Topographic Map. 1954. United States Geological Survey, Washington 25, District of Columbia.
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Tables

Table 1 Subbasin Delineation within the Aucilla Wildlife Management Area				
Basin	Perimeter (feet)	Area (feet)	Acres	Hectares
Direct Runoff to Bay	35,004	32,935,325	756	306
Southeast Wacissa	84,640	110,729,369	2,541	1,029
Cow Creek	92,587	77,387,453	1,777	719
Aucilla River	102,477	181,178,174	4,159	1,683
Welaunee Creek	56,559	86,245,456	1,980	801
Little River	9,673	4,314,121	99	40
Pinhook River	46,127	45,579,145	1,046	423
Hosford Branch Reach	142,040	579,285,260	13,298	5,382
Intermediary Subbasin	23,633	23,851,567	547	222
West Wacissa	180,828	648,755,615	14,893	6,027
Northeast Wacissa	80,013	256,127,619	5,880	2,380

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
1	East-Southeast	2,790.12
2	Southwest	275.43
3	South	974.38
4	Southwest	659.62
5	South	1,066.28
6	South-Southeast	1,343.37
7	South	516.85
8	Southwest	2,192.52
9	South-Southeast	1,524.59
10	East-Southeast	1,323.52
11	East-Southeast	1,059.99
12	South	1,939.08
13	Southwest	140.49
14	South-Southeast	2,285.00
15	East-Southeast	461.69
16	West Southwest	903.11
17	South Southwest	1,428.99
18	South Southwest	168.77
19	South Southwest	3,192.79
20	Southeast	806.99
21	South Southeast	527.28
22	South Southeast	524.67
23	Southeast	545.07
24	South Southeast	164.91
25	South	481.06
26	South	621.01
27	South	490.20
28	South	782.74
29	South Southwest	1,170.57
30	South Southwest	1,353.23
31	South Southwest	464.53
32	Southeast	1,275.03
33	Southeast	4,360.68
34	West Southwest	1,293.41
35	South	398.05
36	South	463.71
37	Southwest	2,509.40
38	Southeast	2,599.80
39	Southwest	27.00
40	Southwest	319.32
41	West Southwest	423.05
42	South	397.89
43	South Southwest	659.19
44	South	222.93
45	South	254.10

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
46	South Southeast	408.62
47	South	607.31
48	South Southwest	890.06
49	Southeast	712.11
50	Southeast	804.93
51	Southwest	481.00
52	South	2,030.90
53	South	897.90
54	West Southwest	1,155.10
55	Southwest	962.49
56	West	1,211.40
57	East Southeast	1,055.67
58	South Southwest	2,356.05
59	Southwest	1,247.52
60	South	741.56
61	South Southwest	1,435.51
62	South	157.99
63	Southwest	1,273.23
64	Southeast	343.90
65	Southeast	27.82
66	South	1,036.96
67	South Southwest	809.31
68	South	1,394.00
69	South Southeast	570.93
70	South	1,110.56
71	East Southeast	1,054.49
72	South Southeast	1,673.97
73	Southwest	333.68
74	East Southeast	1,192.42
75	Southwest	520.61
76	South	3,511.85
77	West Southwest	862.71
78	West Southwest	504.67
79	South	1,215.41
80	South	1,008.37
81	South Southwest	491.72
82	Southeast	352.82
83	Southeast	527.96
84	South	514.59
85	South	577.67
86	South	340.07
87	Southwest	1,011.29
88	South Southeast	639.54
89	South	583.89
90	East Southeast	886.45

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
91	Southwest	612.61
92	West Southwest	2,240.58
93	South	15.84
94	South	562.36
95	East Southeast	235.07
96	South	1,044.11
97	South	3,010.42
98	South	318.62
99	Southwest	286.96
100	South	546.98
101	Southeast	230.50
102	Southeast	396.80
103	Southwest	261.59
104	West Southwest	432.74
105	Southeast	192.91
106	Southwest	291.54
107	South	181.02
108	Southeast	1,399.95
109	South	1,550.71
110	South	1,163.02
111	East Southeast	271.85
112	South	978.25
113	Southwest	666.78
114	South Southeast	636.27
115	South	1,155.46
116	South Southwest	1,453.48
117	South	341.51
118	South Southeast	1,430.54
119	Southwest	16.81
120	South	1,666.89
121	South	678.44
122	West Southwest	1,448.33
123	Southeast	913.33
124	South Southeast	638.74
125	South Southwest	670.91
126	South	773.53
127	Southeast	224.35
128	South Southwest	944.92
129	South	462.28
130	East Southeast	2,312.69
131	South	1,117.42
132	South Southeast	1,533.83
133	South	1,434.05
134	South Southwest	838.54
135	Southwest	745.78

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
136	East Southeast	1,076.28
137	South	3,459.38
138	East Southeast	183.93
139	East Southeast	1,091.15
140	Southwest	2,306.41
141	South	484.66
142	Southeast	1,721.17
143	South Southwest	1,107.97
144	East Southeast	3,065.62
145	South Southwest	723.86
146	West Southwest	284.76
147	South Southwest	733.47
148	South Southwest	733.36
149	West Southwest	576.32
150	South Southeast	933.67
151	Southwest	810.90
152	East Southeast	739.26
153	South	2,330.51
154	South	545.41
155	Southwest	1,734.82
156	South	732.22
157	West Southwest	1,148.37
158	South Southwest	357.60
159	South Southeast	593.98
160	South Southeast	295.31
161	West Southwest	221.96
162	South Southeast	422.78
163	South Southeast	298.40
164	West Southwest	1,226.94
165	South Southwest	1,525.32
166	South Southwest	1,092.67
167	West Southwest	228.67
168	South	443.24
169	East Southeast	237.73
170	South Southeast	426.09
171	South Southeast	740.22
172	South Southwest	4,150.52
173	South Southeast	1,259.92
174	Southeast	1,277.99
175	East Southeast	1,707.19
176	West Southwest	632.85
177	West Southwest	1,754.31
178	Southeast	656.96
179	South	734.74
180	West Southwest	115.30

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
181	East	68.34
182	South	828.41
183	South	3,362.95
184	South Southeast	1,977.15
185	South Southeast	1,944.63
186	South Southeast	969.41
187	South Southeast	1,041.40
188	South Southwest	3,090.21
189	South	3,927.79
190	West Southwest	204.58
191	West Southwest	2,009.52
192	South Southeast	1,604.40
193	West Southwest	1,350.30
194	South Southwest	1,793.44
195	South	1,260.87
196	Southeast	2,120.63
197	Southeast	418.53
198	West Southwest	913.88
199	South	1,345.75
200	East Southeast	361.73
201	Southeast	1,511.32
202	East Southeast	1,127.02
203	East Southeast	840.29
204	West Southwest	1,179.14
205	South Southeast	1,194.55
206	South Southwest	630.31
207	South	1,543.99
208	South	1,806.58
209	East Southeast	853.36
210	South	1,095.07
211	South Southwest	1,717.16
212	East Southeast	1,886.45
213	East Southeast	1,057.65
214	East Southeast	778.00
215	South	1,320.35
216	South	1,544.68
217	Southwest	183.99
218	South	984.87
219	South Southwest	490.19
220	South Southeast	2,040.53
221	South Southeast	1,049.16
222	South Southwest	394.61
223	West Southwest	697.25
224	East Southeast	155.16
225	Southwest	201.72

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
226	Southeast	1,203.82
227	Southwest	170.85
228	Southeast	2,019.64
229	South	1,318.86
230	West Southwest	2,133.15
231	West Southwest	797.68
232	South	2,154.02
233	South Southeast	2,103.01
234	West Southwest	810.19
235	Southwest	102.59
236	Southeast	317.00
237	South	637.83
238	South	911.82
239	South Southwest	617.98
240	South	2,485.49
241	South Southeast	1,054.64
242	East Southeast	672.09
243	East Southeast	1,354.30
244	South	1,642.36
245	South Southeast	2,883.86
246	South	2,276.00
247	East Southeast	1.24
248	Southeast	2,128.80
249	South	1,406.71
250	South	1,529.02
251	South	1,031.03
252	South	873.87
253	South Southeast	2,076.42
254	South Southwest	570.22
255	South Southwest	230.16
256	South Southeast	1,993.41
257	East Southeast	1,125.33
258	South	991.16
259	South	2,882.41
260	Southeast	566.51
261	Southeast	651.92
262	West Southwest	1,220.33
263	West Southwest	1,164.62
264	South Southwest	738.31
265	South	2,372.79
266	West Southwest	571.40
267	West Southwest	1,296.29
268	South	639.41
269	South	1,361.75
270	East Southeast	1,609.01

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
271	South Southwest	2,335.47
272	South	456.22
273	South Southwest	1,720.83
274	South Southwest	583.52
275	South	2,343.47
276	South	315.72
277	South	490.87
278	South	477.71
279	South Southeast	1,225.51
280	South Southeast	182.24
281	West Southwest	426.21
282	East Southeast	937.99
283	South	4,226.64
284	South Southeast	1,185.94
285	South Southeast	957.66
286	South	6,007.49
287	South Southwest	2,296.91
288	South Southwest	3,407.63
289	South	285.59
290	South Southwest	6,835.49
291	South	1.21
292	South	8,509.31
293	East Southeast	1,888.51
294	South	1,581.22
295	South Southwest	751.95
296	South Southeast	388.87
297	South	645.49
298	Southwest	1,187.73
299	South	16,008.87
300	Southeast	3,598.29
301	South	2,341.84
302	South Southwest	1,328.35
303	East Southeast	4,413.07
304	Southeast	265.26
305	South	545.18
306	East Southeast	1,563.60
307	Southeast	508.37
308	South Southwest	109.63
309	West Southwest	1,013.92
310	East Southeast	928.20
311	Southeast	581.07
312	South	424.35
313	South	2,250.95
314	South Southeast	1,498.22
315	South	711.83

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
316	East Southeast	1,424.57
317	South	2,020.01
318	Southeast	439.18
319	South	845.11
320	South	257.15
321	South	517.79
322	East Southeast	551.66
323	Southeast	336.36
324	South	462.25
325	South Southeast	1,619.99
326	South	1,113.89
327	South Southeast	744.58
328	South	1,064.08
329	South	321.04
330	South	654.63
331	South	407.12
332	South	696.80
333	South	749.58
334	Southwest	716.88
335	South	205.34
336	Southeast	325.72
337	South Southwest	2,096.56
338	South	560.72
339	South	799.71
340	South	499.63
341	Southwest	1,162.56
342	West Southwest	593.02
343	West Southwest	1,612.01
344	South	1,776.51
345	Southwest	798.38
346	South	1,350.91
347	South	601.08
348	Southeast	3,154.17
349	East	840.53
350	South	13,493.46
351	South	3,057.42
352	South	1,329.93
353	South	1,549.42
354	South	753.46
355	East Southeast	2,773.00
356	South	609.30
357	South	1,099.19
358	South Southeast	855.04
359	Southeast	686.04
360	East	1,115.17

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
361	South	358.03
362	Southwest	272.83
363	Southeast	3,113.97
364	South	1,305.78
365	South Southwest	1,699.98
366	Southeast	176.39
367	South Southeast	488.35
368	Southeast	1,487.19
369	South	740.42
370	South	702.34
371	East Southeast	1,035.89
372	East Southeast	745.59
373	South	497.74
374	Southwest	436.69
375	Southwest	258.20
376	South Southeast	2,500.90
377	South	686.85
378	South Southeast	877.69
379	West Southwest	658.70
380	East	275.41
381	East	387.94
382	S	787.44
383	Southeast	297.09
384	South	1,608.04
385	South Southwest	1,931.11
386	Southeast	862.74
387	South Southwest	516.04
388	South Southeast	1,807.92
389	South	937.48
390	South	564.24
391	South Southwest	1,573.69
392	Southeast	416.42
393	Southwest	463.28
394	Southeast	1,266.25
395	South	2,853.75
396	Southwest	667.73
397	West	946.71
398	Southwest	477.23
399	Southeast	356.01
400	East Southeast	370.14
401	Southwest	308.98
402	South	1,689.06
403	South	1,147.81
404	South	325.18
405	South Southeast	237.08

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
406	East Southeast	490.41
407	South	328.15
408	South	273.43
409	South Southeast	1,151.96
410	East Southeast	1,313.36
411	South	3,594.95
412	South	3,838.50
413	East Southeast	252.19
414	South Southwest	530.57
415	East Southeast	2,648.58
416	East Southeast	356.69
417	South	1,615.55
418	East Southeast	436.61
419	South	12,728.29
420	South Southwest	1,443.40
421	South Southwest	734.82
422	South	7,864.71
423	South Southwest	1,791.72
424	South Southwest	312.58
425	South	4,829.06
426	South Southeast	4,178.68
427	East Southeast	736.26
428	South Southeast	725.19
429	East	343.65
430	East Southeast	1,948.50
431	South Southeast	648.34
432	East Southeast	884.83
433	Southeast	1,202.13
434	South	772.96
435	West Southwest	393.18
436	South Southwest	1,189.55
437	South Southwest	1,066.58
438	South	813.52
439	South Southeast	1,136.83
440	South	258.31
441	South Southwest	387.12
442	Southwest	457.96
443	South	866.45
444	South	899.38
445	West Southwest	275.03
446	East Southeast	1,403.50
447	Southwest	889.50
448	South	374.54
449	South	226.89
450	South	1,400.78

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
451	South	3,620.31
452	South	1,038.45
453	South	2,275.86
454	Southeast	103.50
455	South	946.85
456	South	357.25
457	South	3,182.77
458	South Southeast	2,427.84
459	South Southeast	114.35
460	Southeast	1,541.69
461	Southeast	555.54
462	South	676.49
463	South Southwest	1,314.69
464	South	2,569.81
465	South	232.30
466	East Southeast	1,047.31
467	South	891.54
468	Southeast	218.21
469	Southeast	1,052.82
470	South Southeast	2,604.69
471	South	2,178.31
472	South	1,406.82
473	South Southwest	419.75
474	Southeast	1,227.11
475	Southeast	190.27
476	South	522.43
477	Southwest	420.65
478	West Southwest	405.05
479	East	287.13
480	South	826.57
481	South Southwest	272.50
482	South	2,247.12
483	East Southeast	138.99
484	Southwest	254.38
485	South Southeast	3,467.60
486	West Southwest	204.97
487	West Southwest	445.74
488	South Southwest	312.72
489	West Southwest	98.87
490	East Southeast	312.80
491	South Southeast	221.61
492	South Southeast	228.24
493	South	978.21
494	South	418.81
495	Southwest	137.21

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
496	South	354.58
497	South	476.33
498	South	254.23
499	South Southeast	2,640.65
500	East Southeast	303.82
501	East Southeast	246.24
502	South	1,167.47
503	Southwest	391.19
504	South Southwest	582.68
505	South	1,074.20
506	South Southeast	632.77
507	East Southeast	456.60
508	West Southwest	454.60
509	South	485.12
510	South Southwest	1,039.82
511	South	187.60
512	South	283.17
513	East Southeast	1,319.96
514	South	4,116.86
515	Southeast	644.84
516	South	4,062.43
517	South	746.87
518	Southwest	2,206.69
519	South	586.92
520	South	366.93
521	South Southeast	529.33
522	South Southeast	1,241.09
523	South Southwest	1,184.79
524	West Southwest	2,274.37
525	South Southwest	3,043.59
526	Southwest	2,843.44
527	Southeast	866.99
528	South	2,086.33
529	West Southwest	854.53
530	East Southeast	600.22
531	East Southeast	484.26
532	South	1,506.41
533	South	2,680.13
534	South	1,357.69
535	East Southeast	444.56
536	South	829.51
537	South	2,012.85
538	South Southwest	701.68
539	South	687.43
540	South	2,704.67

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
541	South	2,033.19
542	West Southwest	767.22
543	South	4,470.93
544	South	1,572.60
545	South Southwest	1,275.56
546	East Southeast	1,761.61
547	South	361.61
548	South Southeast	1,143.93
549	South Southwest	3,818.56
550	West Southwest	704.88
551	West Southwest	787.90
552	Southwest	187.48
553	South Southeast	376.89
554	South	1,067.88
555	Southwest	4,401.43
556	South	1,411.12
557	South	592.14
558	South	2,662.00
559	South	612.06
560	West Southwest	512.24
561	South	532.89
562	South	791.62
563	East Southeast	958.23
564	South Southeast	1,181.94
565	Southeast	290.89
566	West Southwest	623.48
567	South Southwest	1,291.12
568	South	1,201.87
569	South	3,333.13
570	Southwest	689.64
571	South	631.68
572	South	924.74
573	West Southwest	913.97
574	South	1,085.11
575	South Southeast	788.80
576	East	4,639.61
577	South	946.83
578	East Southeast	339.52
579	Southeast	328.89
580	South	434.49
581	South	1,628.41
582	South	591.56
583	Southeast	516.92
584	South	9,568.40
585	South	898.45

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
586	South	2,353.45
587	Southeast	1,128.25
588	South Southwest	1,902.55
589	East Southeast	250.53
590	Southwest	677.75
591	Southwest	201.28
592	South	355.88
593	South Southeast	487.57
594	West Southwest	2,621.39
595	Southwest	527.92
596	Southwest	99.98
597	Southeast	480.08
598	West Southwest	108.26
599	East Southeast	164.82
600	South	2,012.16
601	South	381.07
602	Southeast	253.11
603	Southeast	283.96
604	Southeast	1,903.13
605	South Southwest	798.68
606	South	244.99
607	South Southwest	1,921.61
608	South Southeast	336.20
609	South	2,788.07
610	South	129.57
611	South	461.99
612	South Southwest	842.64
613	Southwest	1,251.13
614	South Southeast	526.19
615	Southeast	383.27
616	West Southwest	1,735.31
617	South	1,939.44
618	Southwest	1,330.79
619	South Southwest	1,656.91
620	West	852.76
621	Southwest	1,936.66
622	South	6,399.81
623	Southwest	1,850.23
624	Southwest	2,319.78
625	Southeast	241.75
626	Southwest	904.48
627	South	298.41
628	Southwest	4,094.66
629	Southwest	1,308.79
630	Southeast	1,382.35

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
631	South	1,238.25
632	South	244.19
633	South	537.82
634	South Southeast	525.53
635	East Southeast	251.41
636	South	1,437.30
637	South	6,450.88
638	West Southwest	4,769.61
639	South	16,066.77
640	South Southwest	1,519.08
641	South	3,632.45
642	South Southeast	2,624.15
643	South	2,000.48
644	South	1,365.32
645	South Southeast	1,738.89
646	West	2,135.15
647	Southwest	2,720.19
648	South Southeast	7,237.06
649	East Southeast	5,758.34
650	South Southeast	1,953.76
651	South Southeast	4,480.77
652	West Southwest	1,714.78
653	South	2,298.84
654	South	1,486.40
655	South Southwest	952.14
656	South Southwest	551.62
657	South Southwest	1,293.56
658	South Southeast	390.37
659	South	1,407.23
660	South	23,284.25
661	South	13,273.81
662	South Southwest	4,268.85
663	South	11,498.80
664	South	1,939.84
665	Southeast	3,406.83
666	South Southwest	4,980.55
667	Southwest	2,658.80
668	Southwest	537.14
669	South	743.83
670	South	639.03
671	Southwest	434.02
672	South	4,969.09
673	South Southeast	532.20
674	South Southwest	3,520.08
675	South Southwest	5,573.27

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
676	South Southwest	4,977.36
677	South	3,050.34
678	South	5,129.14
679	Southwest	11,283.75
680	West Southwest	893.59
681	West	1,774.56
682	Southwest	1,474.67
683	South	1,778.90
684	South	2,012.42
685	West Southwest	1,245.87
686	South	2,459.25
687	South Southwest	2,427.98
688	South Southeast	739.97
689	South Southwest	901.90
690	South	553.50
691	South Southeast	851.43
692	Southeast	705.74
693	Southeast	72.89
694	Southeast	0.06
695	Southeast	1,792.24
696	Southwest	11.94
697	West Southwest	1,051.26
698	Southwest	817.09
699	Southwest	690.01
700	South Southeast	1,406.37
701	South Southeast	689.72
702	South Southwest	4,573.29
703	South Southwest	1,242.21
704	South Southwest	407.91
705	South	748.96
706	South Southeast	1,312.88
707	Southeast	1,252.95
708	South Southeast	2,227.34
709	South Southeast	1,096.29
710	East	1,984.35
711	South Southwest	462.54
712	South	515.33
713	South Southwest	2,139.70
714	South Southeast	344.74
715	West Southwest	852.06
716	Southeast	202.96
717	South	305.32
718	South	1,107.01
719	West Southwest	5,115.93
720	East Southeast	873.52

Table 2 Natural Drainage Ways and Flow Direction		
Current ID	Flow Direction	Length (feet)
721	South	4,757.04
722	East Southeast	612.31
723	South	1,035.89
724	South	7,950.45
725	South	7,909.13
726	South	181.96
727	East	107.24
728	Southwest	254.01
729	Southeast	262.83
730	Southwest	120.32
731	South	219.27
732	South	146.28
733	East	73.58
734	Southeast	94.50
735	South Southwest	277.48
736	South	266.40
737	South	353.30
738	South	190.82
739	South	184.04
740	Southwest	219.49
741	West Southwest	211.05
742	Southeast	215.66
743	Southeast	99.69
744	Southwest	103.81
745	South	230.25
746	East	178.04
747	Southwest	121.78
748	S	161.95
749	Southeast	188.25
750	Southwest	403.11
751	Southwest	792.41
752	Southwest	1,346.16
753	South Southwest	936.95
754	East Southeast	414.31
755	East Southeast	1,711.57
756	Southeast	535.03
757	South Southwest	487.46
758	South	566.32
759	East Southeast	341.31
760	Southeast	383.61
761	South	494.63
762	West Southwest	715.22
763	South	3,647.43
764	South	1,586.91
765	Southeast	490.77

Table 2
Natural Drainage Ways and Flow Direction

Current ID	Flow Direction	Length (feet)
766	South	1,447.81
767	Southwest	715.03
768	South	2,388.62
769	South	1,012.34
770	Southwest	1,045.43
771	West Southwest	771.22
772	South Southeast	907.37
773	Southwest	1,368.18
774	South Southwest	3,325.41
775	South Southeast	873.48
776	Southeast	1,358.70
777	South Southeast	182.12
778	Southeast	1,390.94
779	South Southeast	2,731.73
780	East Southeast	1,216.61
781	West Southwest	955.72
782	South	440.56
783	South	215.20
784	West Southwest	1,055.41
785	South	287.24
786	South	508.78
787	South Southwest	3,197.00
788	South	384.09
789	Southwest	5,069.66
790	Southwest	6,568.59
791	Southeast	376.04
792	Southeast	300.68
793	Southeast	391.63
794	Southeast	1,622.89
795	South Southwest	142.31
796	East Southeast	370.41
797	Southeast	2,274.69

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
0	Southeast	2,549
1	Southeast	2,541
2	Southeast	96
3	Southeast	132
4	Southeast	247
5	South	7,979
6	South	2,767
7	South	7,265
8	South	7,966
9	South	2,755
10	South	10,712
11	East Southeast	3,242
12	East Southeast	1,254
13	South	2,585
14	South	2,576
15	South	1,188
16	South	1,179
17	West	134
18	West	149
19	Southwest	938
20	Southwest	923
21	West Southwest	1,200
22	West Southwest	1,217
23	Southwest	1,005
24	Southwest	997
25	South	3,590
26	South Southeast	918
27	South Southwest	2,651
28	Southwest	127
29	Southwest	135
30	Southwest	448
31	Southwest	451
32	South	214
33	South	199
34	South	4,505
35	South	4,509
36	South	6,159
37	South	1,591
38	South	1,565
39	South	3,955
40	South	5,350
41	Southeast	121
42	Southeast	105
43	West	191
44	West	193

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
45	South	4,088
46	South	4,095
47	West	1,006
48	West	1,018
49	Southeast	610
50	Southeast	594
51	East Southeast	187
52	East Southeast	186
53	West Southwest	1,109
54	West Southwest	1,115
55	South	2,327
56	South	9,398
57	South	7,042
58	South	4,641
59	West	4,751
60	West	720
61	West	4,053
62	South Southwest	3,504
63	South Southwest	3,507
64	South	3,601
65	South	3,592
66	South Southwest	3,416
67	South Southwest	3,413
68	South Southwest	3,327
69	South Southwest	3,327
70	Southeast	37
71	Southeast	46
72	Southeast	481
73	Southeast	477
74	East Southeast	948
75	East Southeast	946
76	West	12
77	East Southeast	1,292
78	East Southeast	1,316
79	West Southwest	1,501
80	West Southwest	1,500
81	West Southwest	868
82	West Southwest	871
83	South Southwest	5,629
84	South Southwest	5,638
85	South	4,456
86	South	4,449
87	East	1,531
88	East	1,528
89	East	752

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
90	East	744
91	East Southeast	395
92	East Southeast	391
93	South	958
94	South	973
95	South	2,555
96	South	2,557
97	West	989
98	West	989
99	West	2,193
100	West	2,194
101	West	1,210
102	West	1,210
103	West	120
104	West	119
105	West	681
106	West	237
107	West	969
108	West	761
109	West	761
110	West	392
111	West	393
112	West	1,458
113	East Southeast	10
114	West	1,412
115	West	2,499
116	West	74
117	West	2,588
118	West	658
119	West	657
120	West	1,175
121	West	1,069
122	West	2,245
123	West	337
124	West	338
125	South	1,988
126	South	1,983
127	Southeast	106
128	Southeast	95
129	South Southeast	368
130	South Southeast	383
131	South Southeast	744
132	South Southeast	729
133	South	92
134	South	2,500

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
135	South	2,599
136	West Southwest	1,981
137	West Southwest	1,980
138	South	7,953
139	South	7,946
140	East Southeast	2,080
141	East Southeast	2,049
142	West Southwest	27
143	East	1,275
144	East	1,276
145	South	8,441
146	South	8,459
147	West Southwest	2,002
148	West Southwest	2,013
149	West Southwest	3,567
150	Southwest	188
151	Southwest	18
152	West Southwest	2,728
153	Southwest	1,028
154	South	1,571
155	South	1,583
156	South	561
157	South	562
158	South	281
159	South	282
160	South	652
161	South	654
162	South	647
163	South	654
164	Southeast	2,332
165	Southeast	2,324
166	Southeast	1,909
167	Southeast	1,912
168	Southwest	1,262
169	Southwest	1,258
170	Southwest	1,503
171	Southwest	1,112
172	Southwest	2,615
173	Southwest	179
174	Southwest	183
175	South	285
176	South	268
177	Southwest	5,430
178	Southwest	458
179	Southwest	4,951

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
180	Southeast	1,234
181	South Southeast	2,084
182	Southeast	3,348
183	South	6,150
184	South	1,526
185	South	4,605
186	South	12,232
187	South	2,599
188	South	1,620
189	South	1,598
190	East Southeast	521
191	East	2,171
192	East	2,696
193	Southwest	3,499
194	Southwest	2,741
195	Southwest	764
196	West Southwest	2,661
197	West Southwest	2,663
198	South	1,377
199	South	1,397
200	South	2,157
201	South	2,158
202	South	729
203	South	730
204	South	2,971
205	South	2,275
206	South	201
207	East Southeast	156
208	Southeast	24
209	East Southeast	109
210	South	32
211	Southwest	516
212	Southwest	1,030
213	Southwest	1,518
214	Southwest	1,501
215	Southeast	3,529
216	Southeast	3,523
217	Southeast	1,214
218	Southeast	930
219	Southeast	2,145
220	South Southwest	621
221	South Southwest	621
222	South	1,676
223	South	945
224	South	718

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
225	South	1,820
226	South	1,351
227	South	601
228	South	607
229	South Southeast	603
230	South Southeast	6,985
231	East Southeast	1,297
232	East Southeast	3,267
233	East Southeast	3,471
234	South Southeast	417
235	East Southeast	15,247
236	Southeast	696
237	South Southeast	7,521
238	Southeast	1,577
239	South Southeast	6,668
240	West Southwest	3,673
241	West Southwest	3,673
242	West	3,369
243	West	3,370
244	South	20,681
245	Southwest	12
246	Southwest	12
247	Southwest	4,434
248	Southwest	26
249	Southwest	4,468
250	South Southwest	920
251	South Southwest	900
252	West Southwest	1,394
253	West Southwest	1,406
254	South Southwest	364
255	South Southwest	366
256	South Southwest	1,052
257	South Southwest	1,052
258	Southwest	295
259	Southwest	302
260	Southwest	9,528
261	South Southwest	6,226
262	Southwest	2,213
263	Southwest	3,249
264	South Southwest	7,208
265	South Southeast	3,663
266	Southwest	9,516
267	South Southwest	6,196
268	Southwest	2,183
269	Southwest	3,210

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
270	South	7,184
271	South Southeast	3,639
272	South	699
273	South	299
274	South	8,253
275	South Southwest	1,497
276	South	809
277	South Southeast	7,875
278	South	9,993
279	South Southwest	2,059
280	South Southeast	1,179
281	Southeast	177
282	Southeast	1,454
283	East Southeast	2,215
284	South	2,222
285	South	2,240
286	South	1,046
287	South	1,060
288	South	316
289	Southeast	18
290	West Southwest	731
291	West Southwest	1,081
292	South Southwest	386
293	South Southwest	386
294	East Southeast	3,825
295	East Southeast	3,833
296	West Southwest	93
297	West Southwest	86
298	South	289
299	South	126
300	South	376
301	South Southwest	2,554
302	South Southwest	2,552
303	West Southwest	821
304	Southwest	795
305	South	1,298
306	South	1,300
307	South	159
308	Southwest	143
309	South	263
310	South	1,655
311	South	1,661
312	South	121
313	South	124
314	Southeast	342

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
315	Southeast	342
316	Southeast	12
317	Southeast	384
318	Southeast	410
319	Southwest	1,702
320	Southwest	282
321	Southwest	1,426
322	South	243
323	South	255
324	South Southeast	1,053
325	Southeast	419
326	South Southeast	1,495
327	South Southeast	213
328	South Southeast	200
329	South	1,737
330	South	1,724
331	West	1,877
332	West	1,877
333	Southeast	4,527
334	South Southwest	1,558
335	South	1,811
336	South	1,800
337	South	2,365
338	South	2,376
339	East Southeast	2,355
340	East Southeast	2,342
341	Southeast	3,713
342	South	3,519
343	Southwest	1,070
344	Southeast	3,936
345	East Southeast	819
346	South	1,418
347	Southwest	567
348	Southwest	4
349	Southwest	590
350	Southwest	1,576
351	Southwest	1,249
352	Southwest	295
353	West Southwest	2,205
354	Southwest	2
355	West Southwest	2,219
356	Southwest	886
357	Southwest	879
358	Southwest	1,360
359	Southwest	1,373

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
360	South	2,042
361	South	2,033
362	South	818
363	South	1,154
364	South Southwest	401
365	South	1,578
366	South Southeast	201
367	South Southeast	202
368	Southeast	192
369	Southeast	180
370	South Southeast	476
371	South Southeast	2
372	South Southeast	483
373	South	2,129
374	South Southeast	3,732
375	South Southeast	5,871
376	South Southwest	2,399
377	South Southwest	2,418
378	South	916
379	South	923
380	South	2,765
381	South	2,755
382	West Southwest	2,863
383	West Southwest	2,856
384	Southeast	729
385	Southeast	730
386	South Southwest	2,382
387	South Southwest	2,356
388	Southwest	2,250
389	Southwest	2,237
390	South	7,748
391	Southeast	905
392	South	6,846
393	Southeast	2,080
394	Southeast	1,658
395	Southeast	607
396	Southeast	2,093
397	Southeast	2,269
398	South	992
399	South	1,002
400	Southwest	2,310
401	Southwest	2,332
402	Southeast	1,035
403	Southeast	1,041
404	Southeast	1,034

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
405	South	3,562
406	South	3,571
407	South Southeast	185
408	South Southeast	185
409	Southeast	316
410	Southeast	265
411	West Southwest	2,327
412	West Southwest	2,329
413	Southwest	515
414	Southwest	476
415	South	6,826
416	South	5,125
417	South	902
418	Southeast	569
419	Southeast	582
420	South	3,671
421	South	3,650
422	South	2,752
423	South	2,749
424	Southeast	7,203
425	Southeast	2,131
426	South	5,062
427	South Southeast	3,263
428	South Southeast	3,254
429	West Southwest	240
430	West Southwest	251
431	Southwest	972
432	Southwest	997
433	East Southeast	1,908
434	East Southeast	1,911
435	Southeast	2,340
436	Southeast	2,332
437	South	1,007
438	South	1,002
439	South	2,153
440	South	2,157
441	West Southwest	2,114
442	West Southwest	1,729
443	West Southwest	2,187
444	West Southwest	1,658
445	Southeast	884
446	South	1,207
447	South	1,221
448	East	724
449	Southeast	2,648

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
450	Southeast	3,341
451	Southwest	43
452	Southwest	54
453	South	2,443
454	South	2,432
455	Southeast	1,722
456	Southeast	1,729
457	West Southwest	714
458	West Southwest	708
459	West Southwest	4,371
460	West Southwest	1,652
461	West Southwest	6,228
462	West Southwest	208
463	West Southwest	3,558
464	West Southwest	3,545
465	East Southeast	6,587
466	East Southeast	6,581
467	East Southeast	11
468	South Southeast	849
469	Southwest	65
470	South Southeast	783
471	South Southwest	2,994
472	South	2,843
473	South	5,847
474	East	445
475	East	3,408
476	East	87
477	East	3,783
478	East	1,777
479	East	1,777
480	East	2,647
481	East	2,648
482	East	296
483	East	563
484	East	1,439
485	East	1,334
486	East	1,686
487	East	3,417
488	East	1,884
489	South	504
490	South	505
491	South	5,287
492	South	5,269
493	South Southeast	3,326
494	South Southeast	3,325

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
495	South	479
496	South	495
497	South	1,432
498	South	2,126
499	Southwest	3,242
500	Southwest	4,973
501	Southeast	2,065
502	South Southeast	2,293
503	West	1,034
504	East	1,034
505	West	1,035
506	West	1,960
507	West	1,961
508	South	1,592
509	South	1,585
510	South	1,893
511	South	1,902
512	East Southeast	3,852
513	East Southeast	3,845
514	Southeast	4,696
515	Southeast	4,709
516	West Southwest	1,641
517	South Southeast	3,773
518	West Southwest	5,446
519	West	2,198
520	West	2,228
521	West	363
522	West	362
523	West	882
524	West	883
525	South	4,370
526	East	228
527	South	11,105
528	Southeast	82
529	East	1,022
530	East	1,133
531	South Southeast	5,197
532	South Southeast	5,187
533	East	1,030
534	East	997
535	Southeast	1,974
536	South Southeast	1,638
537	Southeast	4,371
538	Southeast	3,141
539	Southeast	3,127

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
540	Southeast	945
541	Southeast	928
542	South	755
543	South	760
544	South	569
545	South	568
546	Southeast	6,111
547	South	5,200
548	South	2,327
549	South Southeast	3,265
550	Southeast	5,613
551	East	948
552	East	934
553	South	5,137
554	South	5,138
555	West Southwest	1,506
556	West Southwest	1,490
557	South	3,449
558	South	3,450
559	South	8,671
560	South	2,937
561	West Southwest	2,193
562	West Southwest	6,739
563	West Southwest	84
564	West Southwest	3,591
565	Southwest	3,670
566	Southwest	1,566
567	South	5,402
568	South	5,399
569	South	5,068
570	South	6,580
571	West	3,747
572	West Southwest	2
573	West	3,768
574	West	1,569
575	West	1,567
576	East	999
577	East	1,000
578	East	946
579	East	942
580	South	7,161
581	South	3,378
582	Southwest	3,446
583	South	1,556
584	Southwest	327

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
585	West Southwest	317
586	West Southwest	923
587	South	143
588	East	402
589	East	399
590	Southeast	6,102
591	Southeast	6,095
592	South Southwest	4,949
593	South Southwest	3,037
594	South	6,118
595	Southeast	808
596	East Southeast	1,608
597	East Southeast	1,272
598	East Southeast	358
599	East	2,730
600	East	403
601	East	3,126
602	South Southwest	2,024
603	South	2,060
604	Southwest	885
605	Southwest	859
606	South Southwest	1,364
607	South Southwest	509
608	Southwest	733
609	Southwest	740
610	West Southwest	609
611	West Southwest	614
612	Southwest	810
613	Southwest	825
614	Southwest	476
615	Southwest	419
616	Southwest	296
617	Southwest	294
618	South	783
619	South	793
620	Southeast	1,484
621	Southeast	1,478
622	East Southeast	2,193
623	South	2,894
624	South Southwest	2,809
625	West Southwest	4,009
626	West Southwest	4,010
627	Southeast	2,155
628	Southeast	5
629	Southeast	2,167

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
630	Southeast	8
631	South	2,373
632	South	2,372
633	South Southeast	3,751
634	Southeast	2,033
635	South	1,725
636	South	3,626
637	South	3,609
638	West	4,589
639	West	1,929
640	West	2,631
641	West	1,459
642	West Southwest	2,440
643	West Southwest	524
644	West Southwest	1,912
645	South	8,556
646	South	8,530
647	South	48,265
648	South	2,145
649	South	2,121
650	South	84,230
651	West	2,683
652	West	4,175
653	West	6,864
654	South	2,617
655	South	2,625
656	South	2,655
657	South	0
658	South	2,646
659	West	1,107
660	West	1,433
661	West	386
662	West	2,153
663	West	5,020
664	West	5,042
665	Southwest	794
666	Southwest	2,443
667	Southwest	13
668	Southwest	3,236
669	Southeast	517
670	Southeast	502
671	South	225
672	South	214
673	South	2,611
674	South	2,610

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
675	East	3,099
676	East	3,106
677	East	1,526
678	East	1,537
679	Southwest	4,103
680	Southwest	4,096
681	East	4,042
682	East	3,219
683	East	816
684	South	2,647
685	South	2,648
686	South	2,630
687	South	2,630
688	West	648
689	West	1,505
690	East	2,159
691	West	2,245
692	West	2,257
693	West	2,930
694	West	2,913
695	South	2,019
696	South	2,016
697	South	2,186
698	South	2,204
699	South	15,636
700	South	775
701	Southeast	5,563
702	Southeast	5,623
703	South	13,347
704	South	7,128
705	South	11,121
706	South	750
707	Southwest	1,739
708	Southeast	4,350
709	East Southeast	2,826
710	West Southwest	2,231
711	South Southwest	1,555
712	Southeast	4,526
713	South	4,807
714	South	121
715	West	4,905
716	Southwest	1,586
717	South	14,049
718	South Southeast	682
719	Southwest	5,036

Table 3 Ditches and Flow Direction		
Ditch ID	Flow Direction	Length (feet)
720	Southwest	10,415
721	Southwest	5,135
722	Southwest	10,415
723	South	8,325
724	South	1,640
725	South	1,640
726	South	6,224
727	South	6,202
728	South	6,483
729	South	6,456
730	West	5,022
731	West	5,028

Table 4
Existing Water Control Structures

Structure ID	Structure Type	Flow Direction	Condition	Construction Material	Easting	Northing	Latitude	Longitude
1	Culvert	no flow		METAL	396431.02	698898.78	30 17 50.84887	-84 02 13.71941
2	Culvert	Southeast		METAL	396964.07	695550.16	30 16 02.23900	-84 01 53.71554
3	Culvert	Southwest	CRUSHED END	2 FT CONCRETE	396897.58	695239.77	30 15 52.17102	-84 01 56.20300
4	Culvert	East	POOR	2 FT METAL	396064.20	694647.75	30 15 32.96074	-84 02 27.41028
5	Impassible Area			ROAD ENDS	396687.13	691602.34	30 13 54.18930	-84 02 04.04725
6	Bridge	NW	LOG JAM		397658.37	692226.43	30 14 14.43876	-84 01 27.68480
7	Culvert	no flow	OK	METAL	397650.54	692254.41	30 14 15.34621	-84 01 27.97831
8	Low Water Crossing	South	NEEDS MORE ROCK		399164.40	692193.44	30 14 13.37539	-84 00 31.28983
9	Low Water Crossing	no flow	POOR		397320.95	693020.31	30 14 40.18582	-84 01 40.32653
10	Culvert	East	GOOD	2, 2 FT METAL	396057.21	693047.63	30 14 41.06076	-84 02 27.65220
11	Impassible Area				397083.07	689844.17	30 12 57.16714	-84 01 49.20578
12	Impassible Area				396146.79	690273.82	30 13 11.09413	-84 02 24.26399
13	Gate				407011.47	703802.26	30 20 29.85043	-83 55 37.19129
14	Low Water Crossing	no flow	POOR	COBBLE	405844.18	703003.87	30 20 03.97370	-83 56 20.95926
15	Culvert	no flow	OK	METAL	405400.93	703288.85	30 20 13.22448	-83 56 37.56750
16	Low Water Crossing	no flow			404959.30	703458.24	30 20 18.72521	-83 56 54.11753
17	Low Water Crossing	no flow	POOR	COBBLE	404632.10	703354.22	30 20 15.35528	-83 57 06.38309
18	Low Water Crossing	NW	POOR	COBBLE	403892.99	703411.27	30 20 17.21468	-83 57 34.08502
19	Impassible Area				403890.24	702080.08	30 19 34.03513	-83 57 34.20450
20	Impassible Area				406507.64	700932.25	30 18 56.76635	-83 55 56.13560
21	Impassible Area				405295.23	699048.29	30 17 55.67762	-83 56 41.60029
22	Impassible Area				403867.41	700897.00	30 18 55.66061	-83 57 35.07473
23	Low Water Crossing	Southwest	GOOD	GRAVEL	403917.17	700212.92	30 18 33.47114	-83 57 33.21853
24	Low Water Crossing	Southwest	GOOD	GRAVEL	403968.76	699990.13	30 18 26.24404	-83 57 31.28814
25	Low Water Crossing	East	GOOD	GRAVEL	403988.03	699804.04	30 18 20.20770	-83 57 30.56861
26	Low Water Crossing	East	GOOD	GRAVEL	403979.05	699451.82	30 18 08.78317	-83 57 30.90924
27	Culvert	West	NEW	3 FT METAL	403916.61	699161.75	30 17 59.37518	-83 57 33.25244
28	Culvert	Southwest	GOOD	3 FT METAL	404090.12	698240.16	30 17 29.48050	-83 57 26.76348
29	Drainage Way	Southwest	POOR	BOGGED OUT AREA	404649.20	698539.25	30 17 39.17533	-83 57 05.81303
30	Impassible Area			DEEPLY RUTTED	402234.31	698551.74	30 17 39.60308	-83 58 36.28927
31	Culvert	Southeast	GOOD	3 FT METAL	404841.42	697316.26	30 16 59.50405	-83 56 58.62995
32	Gate				404771.76	696082.50	30 16 19.48732	-83 57 01.25838
33	Gate				404299.49	692818.41	30 14 33.62179	-83 57 18.99306
34	Gate				404636.56	692112.09	30 14 10.70830	-83 57 06.38078
35	Low Water Crossing	South	OK	COBBLE	404260.39	692818.82	30 14 33.63558	-83 57 20.45704
36	Culvert	West	DESTROYED	METAL	402609.79	691662.85	30 13 56.15767	-83 58 22.27814
37	Low Water Crossing	East	UNCOBBLED		404165.61	691114.61	30 13 38.36111	-83 57 24.02881
38	Low Water Crossing	West	OK	COBBLE	403627.02	695635.90	30 16 05.01481	-83 57 44.14313

Table 4
Existing Water Control Structures

Structure ID	Structure Type	Flow Direction	Condition	Construction Material	Easting	Northing	Latitude	Longitude
39	Low Water Crossing	West	OK	COBBLE	403629.90	695659.77	30 16 05.78888	-83 57 44.03531
40	Low Water Crossing	West	POOR	COBBLE	403626.88	695687.22	30 16 06.67924	-83 57 44.14781
41	Low Water Crossing	West	POOR	COBBLE/MUD	403640.74	695880.49	30 16 12.94806	-83 57 43.62656
42	Culvert	West	OK	4 FT METAL	403111.36	697140.60	30 16 53.82527	-83 58 03.44345
43	Low Water Crossing	West	OK		403120.22	697205.76	30 16 55.93861	-83 58 03.11077
44	Low Water Crossing	West	POOR	COBBLE	403112.11	697244.68	30 16 57.20124	-83 58 03.41443
45	Low Water Crossing	West	POOR	COBBLE	403109.15	697300.33	30 16 59.00606	-83 58 03.52481
46	Low Water Crossing	West	OK	COBBLE	403109.53	697349.85	30 17 00.61228	-83 58 03.51005
47	Low Water Crossing	West	OK	COBBLE	403107.84	697457.54	30 17 04.10532	-83 58 03.57229
48	Culvert	West	GOOD	3 FT METAL	400206.40	683378.72	30 09 27.47970	-83 59 52.27692
49	Low Water Crossing	East	GOOD	COBBLE	400096.42	683235.27	30 09 22.82735	-83 59 56.39230
50	Drainage Way	Southeast	OK	FORMER CULVERT LOCATION	399155.07	683735.08	30 09 39.03692	-84 00 31.61660
51	Low Water Crossing	West	GOOD	COBBLE	399903.17	682914.03	30 09 12.40841	-84 00 03.62318
52	Impassible Area	West	GOOD		399919.18	682861.28	30 09 10.69776	-84 00 03.02382
53	Low Water Crossing	West	GOOD	COBBLE	399646.75	682243.23	30 08 50.65235	-84 00 13.21668
54	Washout	West			399564.79	682132.88	30 08 47.07319	-84 00 16.28320
55	Low Water Crossing	Southwest	POOR	DIRT	400672.71	682922.95	30 09 12.69731	-83 59 34.82934
56	Gate				400455.51	683270.60	30 09 23.97305	-83 59 42.95580
57	Bridge	Southwest			400857.54	683028.09	30 09 16.10690	-83 59 27.91352
58	Culvert	Northeast	GOOD	2 FT CONCRETE	399791.23	683751.90	30 09 39.58315	-84 00 07.81214
59	Culvert	Southeast	GOOD	METAL	401081.90	684729.64	30 10 11.29321	-83 59 19.51274
60	Culvert	Southeast	OK	3 FT METAL	401160.54	684768.21	30 10 12.54374	-83 59 16.56982
61	Culvert	Southeast	GOOD	4, 2 FT METAL	401277.18	684835.77	30 10 14.73474	-83 59 12.20442
62	Culvert	no flow	OK	3 FT METAL	402037.45	685255.63	30 10 28.34886	-83 58 43.75052
63	Impassible Area		DEEP MUD IMPASS		402127.89	685139.96	30 10 24.59680	-83 58 40.36631
64	Culvert	Southeast	GOOD	3 FT METAL	401425.28	686908.89	30 11 21.97302	-83 59 06.65261
65	Culvert	Southeast	OK	2, 2 FT METAL	400958.86	687983.98	30 11 56.84402	-83 59 24.10721
66	Culvert	West	POOR	3 FT METAL	401301.62	688586.51	30 12 16.38522	-83 59 11.27450
67	Culvert	West	POOR	2 FT METAL	401290.89	688873.07	30 12 25.67977	-83 59 11.67475
68	Culvert	East	POOR	2 FT	401283.45	689176.81	30 12 35.53117	-83 59 11.95213
69	Culvert	West	POOR	2 FT METAL	401282.59	689317.66	30 12 40.09957	-83 59 11.98399
70	Culvert	West	POOR	2 FT	401275.69	691289.84	30 13 44.06603	-83 59 12.23430
71	Impassible Area	East	POOR	RUTTED ROAD	401212.85	693305.72	30 14 49.45114	-83 59 14.57941
72	Low Water Crossing	East	OK	COBBLE	400028.74	684609.31	30 10 07.39211	-83 59 58.92446
73	Impassible Area				399142.07	684078.97	30 09 50.19016	-84 00 32.10390
74	Culvert	Southeast	GOOD	CONCRETE BOX CULVERT	400151.38	704433.43	30 20 50.39110	-83 59 54.32568

Table 4
Existing Water Control Structures

Structure ID	Structure Type	Flow Direction	Condition	Construction Material	Easting	Northing	Latitude	Longitude
75	Culvert	Southeast	GOOD	3 FT CONCRETE	398641.20	703702.66	30 20 26.68441	-84 00 50.93118
76	Culvert	Southeast	GOOD	2, 3 FT CONCRETE	397556.62	703131.55	30 20 08.15392	-84 01 31.57914
77	Culvert	Southeast	GOOD	3, 3 FT CONCRETE	397199.57	702219.73	30 19 38.57484	-84 01 44.95339
78	Culvert	Northeast	GOOD	3, 3 FT CONCRETE	396353.58	701430.24	30 19 12.95922	-84 02 16.64999
79	Culvert	no flow	GOOD	3 FT CONCRETE	396073.33	701172.26	30 19 04.58839	-84 02 27.07440
80	Culvert	Southwest	GOOD	3, 3 FT CONCRETE	395668.01	700645.49	30 18 47.49739	-84 02 42.33113
81	Culvert	no flow	GOOD	3 FT CONCRETE	395409.81	699758.68	30 18 18.72947	-84 02 51.99367
82	Culvert	East	GOOD	2, 3 FT CONCRETE	395392.05	699251.54	30 18 02.27941	-84 02 52.65208
83	Culvert	East	GOOD	2, 4 FT CONCRETE	395367.54	698532.84	30 17 38.96743	-84 02 53.55978
84	Culvert	East	GOOD	3 FT CONCRETE	395904.82	697314.99	30 16 59.47212	-84 02 33.41411
85	Culvert	East	GOOD	3 FT CONCRETE	395938.63	696075.55	30 16 19.27049	-84 02 32.13154
86	Culvert	East	GOOD	3, 3 FT CONCRETE	395912.54	694509.42	30 15 28.47226	-84 02 33.08867
87	Culvert	East	GOOD	4, 3 FT CONCRETE	395894.90	693777.35	30 15 04.72712	-84 02 33.73991
88	Culvert	East	GOOD	3 FT CONCRETE	395895.46	692984.52	30 14 39.01175	-84 02 33.70862
89	Culvert	West	GOOD	4, 3 FT CONCRETE	395909.19	693772.66	30 15 04.57520	-84 02 33.20473
90	Culvert	East	GOOD	3, 3 FT CONCRETE	395896.25	691465.74	30 13 49.75054	-84 02 33.65934
91	Culvert	West	GOOD	3, 3 FT CONCRETE	395851.13	691120.16	30 13 38.54122	-84 02 35.34443
92	Culvert	West	GOOD	2, 3 FT CONCRETE	395249.07	690173.12	30 13 07.81723	-84 02 57.87294
93	Culvert	East	GOOD	2, 3 FT CONCRETE	395224.62	689618.54	30 12 49.82944	-84 02 58.78000
94	Low Water Crossing	Southeast	OK	COBBLE	396866.60	689557.59	30 12 47.87039	-84 01 57.30708
95	Impassible Area				397243.88	689386.31	30 12 42.31822	-84 01 43.18111
96	Culvert	Southeast	GOOD	CEMENT BOXED	397265.69	686742.91	30 11 16.58213	-84 01 42.34174
97	Culvert	Southeast	GOOD	CULVERT	396851.90	686779.66	30 11 17.77067	-84 01 57.82991
98	Culvert	Southeast	GOOD	CONCRETE BOX	396260.70	686834.58	30 11 19.54655	-84 02 19.95839
99	Culvert	no flow	GOOD	CULVERT	395183.28	687938.03	30 11 55.32310	-84 03 00.30182
100	Culvert	West	GOOD	3, 3 FT CONCRETE	395210.30	688510.71	30 12 13.89769	-84 02 59.29933
101	Culvert	West	GOOD	2, 3 FT CONCRETE	395223.02	689096.25	30 12 32.88946	-84 02 58.83184
102	Low Water Crossing	East	GOOD	3 FT CONCRETE	398116.52	687437.79	30 11 39.12522	-84 01 10.50035
103	Culvert	no flow	NEW	COBBLE	407830.09	688067.43	30 11 59.46778	-83 55 06.89675
104	sink hole	na		2, 4 FT METAL	407351.96	687845.81	30 11 52.28966	-83 55 24.79987
105	sinkhole	na			407333.93	687737.60	30 11 48.78060	-83 55 25.47703
106	Low Water Crossing	South	GOOD	COBBLE	404859.36	690006.19	30 13 02.40157	-83 56 58.07011
107	Low Water Crossing	South	OK	COBBLE	404588.02	689988.56	30 13 01.83317	-83 57 08.22917
108	Gate				404426.87	690000.22	30 13 02.21333	-83 57 14.26226
109	Culvert	West	NEW	2 FT PLASTIC	407173.22	692716.42	30 14 30.26879	-83 55 31.38006

Table 4 Existing Water Control Structures								
Structure ID	Structure Type	Flow Direction	Condition	Construction Material	Easting	Northing	Latitude	Longitude
110	Bridge	East	NEW	2 LANE	408923.48	695360.02	30 15 55.97572	-83 54 25.76254
J11	Culvert	no flow			404955.23	700169.68	30 18 32.05591	-83 56 54.32186

Notes: ft = feet

Table 5 Unverified Water Control Structures				
Structure	Easting	Northing	Latitude	Longitude
Low Water Crossing	404,179.47	686,797.50	30 11 18.33904 -83 57 23.56690	
Low Water Crossing	404,281.94	686,666.08	30 11 14.07545 -83 57 19.73347	
Washout	404,198.89	686,606.78	30 11 12.15301 -83 57 22.84272	
Washout	404,554.90	687,978.27	30 11 56.63152 -83 57 09.49788	
Bridge	403,154.86	687,158.20	30 11 30.04832 -83 58 01.91323	
Culvert	401,278.31	689,168.89	30 12 35.27449 -83 59 12.14455	
Recommended Bridge Removal	404,952.86	687,106.71	30 11 28.35816 -83 56 54.61494	
Change to Washout	397,844.87	691,311.50	30 13 44.76468 -84 01 20.69472	
Washout	402,591.54	692,562.92	30 14 25.35112 -83 58 22.95437	

Table 6 Recommended Water Control Structures					
Structure Type	Township, Section, Range	Easting	Northing	Latitude	Longitude
Low Water Crossing	02S03E10	398,370.60	702,592.21	30 19 50.66407	-84 01 01.06795
Low Water Crossing	02S03E03	398,680.93	702,829.91	30 19 58.37542	-84 00 49.43826
Low Water Crossing	02S03E03	399,024.27	703,034.59	30 20 05.01576	-84 00 36.57064
Low Water Crossing	02S03E10	398,938.43	702,453.55	30 19 46.16861	-84 00 39.78583
Low Water Crossing	02S04E07	402,784.44	701,291.13	30 19 08.45440	-83 58 15.65404
Low Water Crossing	02S04E07	402,971.25	701,206.66	30 19 05.71325	-83 58 08.65412
Low Water Crossing	02S04E05	404,206.34	703,492.62	30 20 19.84970	-83 57 22.33948
Low Water Crossing	02S04E05	404,590.65	703,360.29	30 20 15.55274	-83 57 07.93652
Low Water Crossing	02S04E05	404,969.34	703,564.41	30 20 22.16893	-83 56 53.73971
Culvert	02S04E05	405,070.70	703,592.57	30 20 23.08081	-83 56 49.94016
Culvert	02S04E05	405,146.72	703,451.79	30 20 18.51346	-83 56 47.09310
Low Water Crossing	02S04E08	404,711.97	702,671.48	30 19 53.20852	-83 57 03.39962
Low Water Crossing	02S04E08	405,159.43	702,197.59	30 19 37.83122	-83 56 46.63694
Low Water Crossing	02S04E09	405,982.13	701,993.24	30 19 31.19016	-83 56 15.80820
Low Water Crossing	02S04E16	406,684.05	701,054.68	30 19 00.73434	-83 55 49.52215
Low Water Crossing	02S04E16	406,963.14	700,849.61	30 18 54.07740	-83 55 39.06804
Low Water Crossing	02S03E14	400,074.73	700,709.78	30 18 49.60814	-83 59 57.19985
Low Water Crossing	02S03E14	399,408.32	700,813.48	30 18 52.97148	-84 00 22.17215
Low Water Crossing	02S03E14	399,335.34	699,778.34	30 18 19.39543	-84 00 24.90469
Low Water Crossing	02S03E15	398,484.07	700,840.91	30 18 53.85859	-84 00 56.80692
Low Water Crossing	02S03E15	397,756.06	700,196.10	30 18 32.93957	-84 01 24.08340
Low Water Crossing	02S03E15	397,711.48	699,670.15	30 18 15.87942	-84 01 25.74977
Low Water Crossing	02S03E15	398,647.50	700,118.84	30 18 30.43796	-84 00 50.67950
Low Water Crossing	02S03E22	398,335.49	699,227.40	30 18 01.52168	-84 01 02.36600
Low Water Crossing	02S03E22	398,377.10	699,034.25	30 17 55.25696	-84 01 00.80630
Low Water Crossing	02S03E22	398,680.19	698,936.19	30 17 52.07755	-84 00 49.44978
Low Water Crossing	02S03E22	398,929.79	698,945.11	30 17 52.36753	-84 00 40.09781
Low Water Crossing	02S03E16	396,504.84	699,859.17	30 18 22.00090	-84 02 10.96426
Low Water Crossing	02S03E29	395,898.24	697,777.23	30 17 14.46490	-84 02 33.66679
Low Water Crossing	02S03E28	396,643.62	696,871.36	30 16 45.09023	-84 02 05.73241
Low Water Crossing	02S03E28	396,787.21	696,689.77	30 16 39.20138	-84 02 00.35171
Low Water Crossing	02S03E28	396,928.68	696,301.24	30 16 26.60048	-84 01 55.04826
Low Water Crossing	02S03E27	398,939.55	697,320.62	30 16 59.67606	-84 00 39.72686
Low Water Crossing	02S03E33	397,001.91	695,826.63	30 16 11.20703	-84 01 52.30096
Culvert	02S03E33	396,277.51	695,287.81	30 15 53.72345	-84 02 19.42847
Culvert	02S03E33	396,905.77	695,238.62	30 15 52.13390	-84 01 55.89631
Culvert	02S03E33	396,662.07	694,643.91	30 15 32.84197	-84 02 05.01796
Low Water Crossing	02S03E34	398,664.21	696,102.75	30 16 20.17290	-84 00 50.03654
Low Water Crossing	02S03E34	398,659.74	695,425.31	30 15 58.19983	-84 00 50.20117
Culvert	03S03E03	399,100.18	694,569.01	30 15 30.42677	-84 00 33.70126

Table 6 Recommended Water Control Structures					
Structure Type	Township, Section, Range	Easting	Northing	Latitude	Longitude
Low Water Crossing	02S03E35	399,364.01	695,434.26	30 15 58.49179	-84 00 23.82192
Low Water Crossing	02S03E35	399,357.30	695,177.14	30 15 50.15221	-84 00 24.07266
Culvert	03S03E04	397,026.64	694,233.84	30 15 19.54462	-84 01 51.35941
Culvert	03S03E04	396,094.06	693,849.30	30 15 07.06313	-84 02 26.28193
Culvert	03S03E04	396,372.69	693,835.48	30 15 06.61788	-84 02 15.84704
Culvert	03S03E04	396,563.81	693,837.79	30 15 06.69438	-84 02 08.68938
Culvert	03S03E09	397,286.84	693,024.95	30 14 40.33604	-84 01 41.60388
Culvert	03S03E03	398,981.88	693,950.85	30 15 10.37653	-84 00 38.13019
Culvert	03S03E03	398,380.01	693,806.31	30 15 05.68613	-84 01 00.67015
Culvert	03S03E03	397,721.28	693,811.05	30 15 05.83632	-84 01 25.34045
Culvert	03S03E10	398,055.39	693,003.04	30 14 39.63034	-84 01 12.82285
Culvert	03S03E10	398,190.45	692,960.39	30 14 38.24765	-84 01 07.76467
Culvert	03S03E02	400,278.10	693,800.84	30 15 05.51207	-83 59 49.58477
Culvert	03S03E10	398,197.64	692,174.03	30 14 12.74222	-84 01 07.49093
Culvert	03S03E10	398,337.47	692,173.83	30 14 12.73661	-84 01 02.25509
Culvert	03S03E09	397,512.21	691,564.01	30 13 52.95248	-84 01 33.15274
Culvert	03S03E10	398,956.28	692,190.47	30 14 13.27852	-84 00 39.08311
Culvert	03S03E09	397,063.37	692,211.79	30 14 13.95978	-84 01 49.96510
Culvert	03S03E16	396,581.45	691,015.58	30 13 35.15700	-84 02 07.99836
Culvert	03S03E16	397,319.79	690,779.04	30 13 27.49084	-84 01 40.35101
Culvert	03S03E16	397,124.71	689,991.27	30 13 01.93883	-84 01 47.64799
Culvert	03S03E15	397,684.51	691,301.03	30 13 44.42401	-84 01 26.69920
Culvert	03S03E15	398,276.54	691,278.12	30 13 43.68410	-84 01 04.53162
Culvert	03S03E15	398,216.12	689,835.55	30 12 56.89480	-84 01 06.78576
Culvert	03S03E21	397,342.63	689,315.42	30 12 40.01947	-84 01 39.48373
Culvert	03S03E22	398,074.74	689,378.17	30 12 42.05948	-84 01 12.07592
Culvert	03S03E22	397,843.87	688,980.38	30 12 29.15600	-84 01 20.71632
Culvert	03S03E22	398,793.45	688,808.51	30 12 23.58616	-84 00 45.16772
Culvert	03S04E19	403,639.50	688,893.17	30 12 26.31593	-83 57 43.75325
Culvert	03S04E17	404,733.25	690,003.08	30 13 02.30239	-83 57 02.79148
Culvert	03S04E17	404,855.65	689,999.28	30 13 02.17740	-83 56 58.20914
Culvert	03S03E28	397,211.27	687,671.89	30 11 46.71218	-84 01 44.38700
Culvert	03S03E28	397,278.80	687,216.94	30 11 31.95683	-84 01 41.85527
Culvert	03S03E28	397,314.34	686,945.03	30 11 23.13816	-84 01 40.52258
Culvert	03S03E28	398,228.40	687,804.96	30 11 51.03438	-84 01 06.31474
Culvert	03S03E28	398,201.92	687,704.56	30 11 47.77796	-84 01 07.30535
Culvert	04S03E02	399,321.22	683,628.38	30 09 35.57653	-84 00 25.39904
Culvert	04S03E02	399,607.60	683,484.07	30 09 30.89642	-84 00 14.68318
Culvert	04S03E11	399,866.91	683,344.26	30 09 26.36237	-84 00 04.98006
Culvert	04S03E02	400,123.96	684,214.65	30 09 54.59188	-83 59 55.36115

Table 6 Recommended Water Control Structures					
Structure Type	Township, Section, Range	Easting	Northing	Latitude	Longitude
Culvert	04S03E02	400,299.85	684,307.10	30 09 57.59024	-83 59 48.77945
Culvert	04S03E02	400,552.39	684,446.90	30 10 02.12423	-83 59 39.32858
Culvert	04S03E01	400,838.76	684,602.49	30 10 07.16992	-83 59 28.61178
Low Water Crossing	02S03E10	398,928.05	702,270.83	30 19 40.24150	-84 00 40.17424
Ditch Plug	03S03E16	396,489.30	690,879.79	30 13 30.75179	-84 02 11.44680
Ditch Plug	04S03E11	400,078.69	683,248.69	30 09 23.26255	-83 59 57.05552
Ditch Plug	04S03E02	400,418.23	684,380.49	30 09 59.97053	-83 59 44.34914
Ditch Plug	03S03E28	398,764.76	686,684.83	30 11 14.70656	-84 00 46.23318
Ditch Plug	03S03E25	401,332.54	687,770.25	30 11 49.91060	-83 59 10.12049
Ditch Plug	03S03E24	401,318.24	688,424.28	30 12 11.12342	-83 59 10.65289
Ditch Plug	03S03E24	401,289.65	689,535.77	30 12 47.17379	-83 59 11.71864
Ditch Plug	03S03E16	396,186.99	690,453.33	30 13 16.91681	-84 02 22.76099
Ditch Plug	03S03E21	396,083.15	689,785.81	30 12 55.26508	-84 02 26.64042
Ditch Plug	03S03E21	396,013.93	688,856.23	30 12 25.11396	-84 02 29.22040
Ditch Plug	03S03E28	396,186.99	687,526.13	30 11 41.97538	-84 02 22.72578
Ditch Plug	03S03E21	397,007.79	689,058.96	30 12 31.69876	-84 01 52.01656
Ditch Plug	03S03E21	397,081.96	688,564.50	30 12 15.66198	-84 01 49.23541
Ditch Plug	03S03E28	397,151.18	688,114.54	30 12 01.06855	-84 01 46.63999

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Figures

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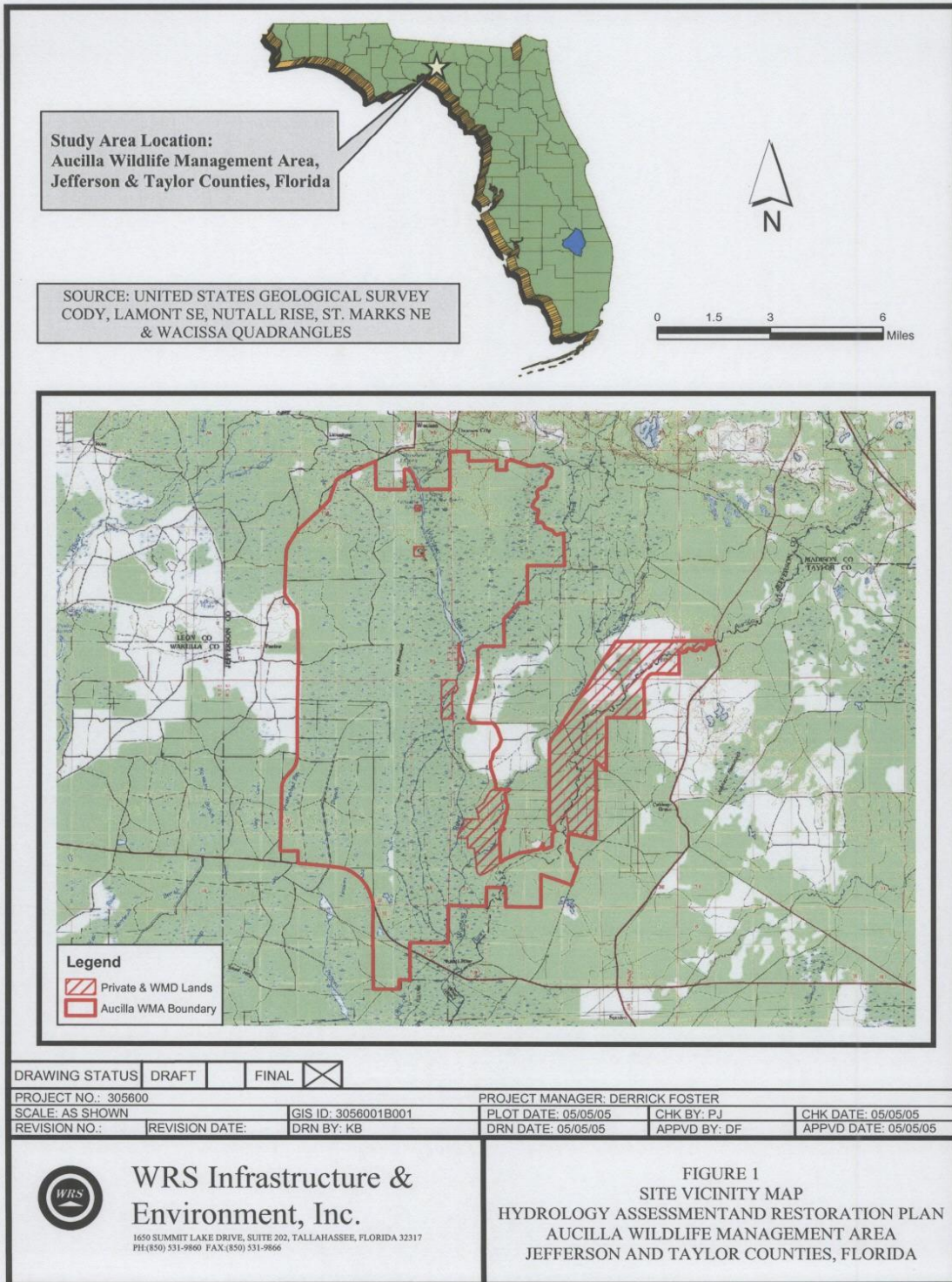
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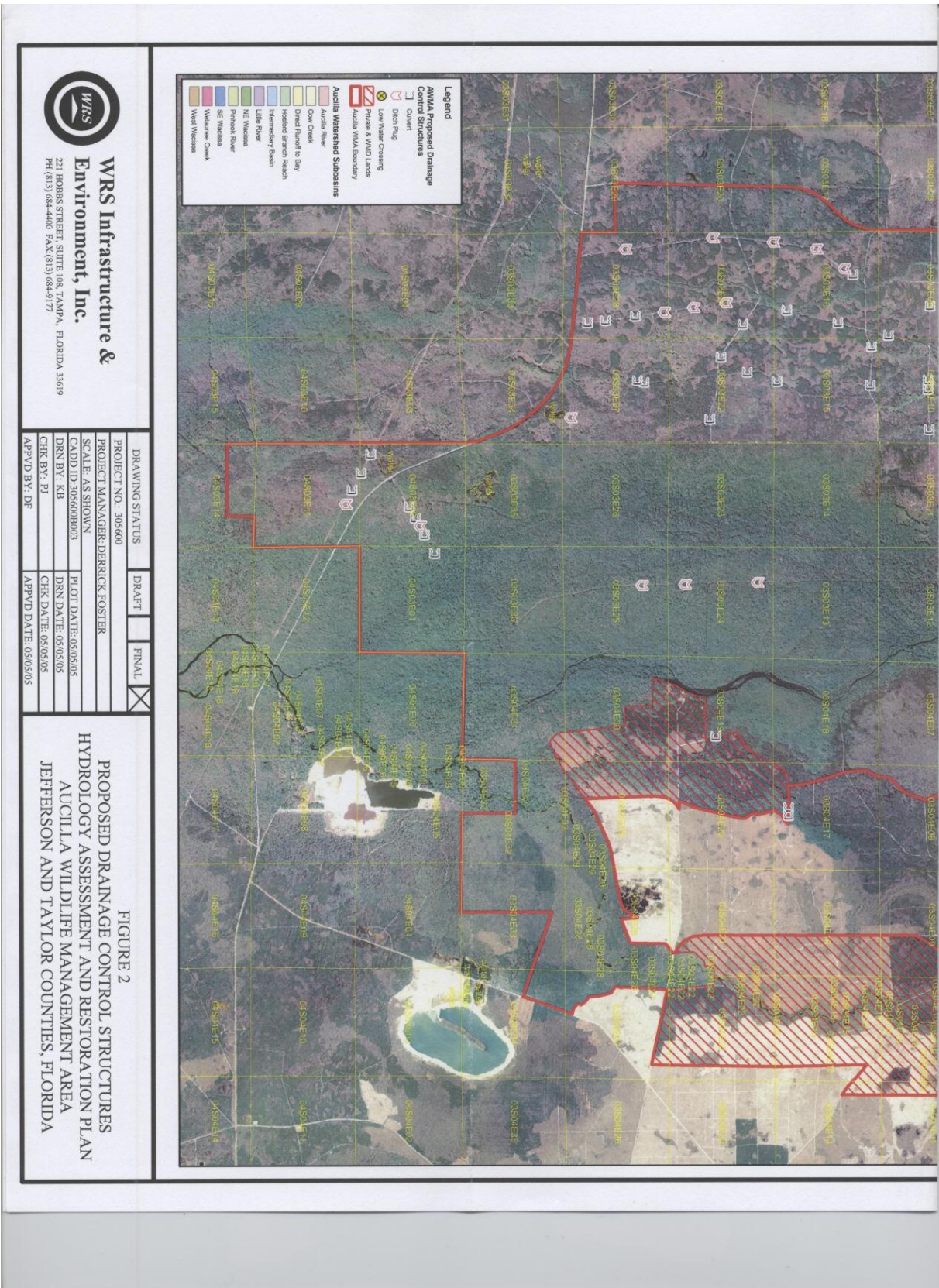
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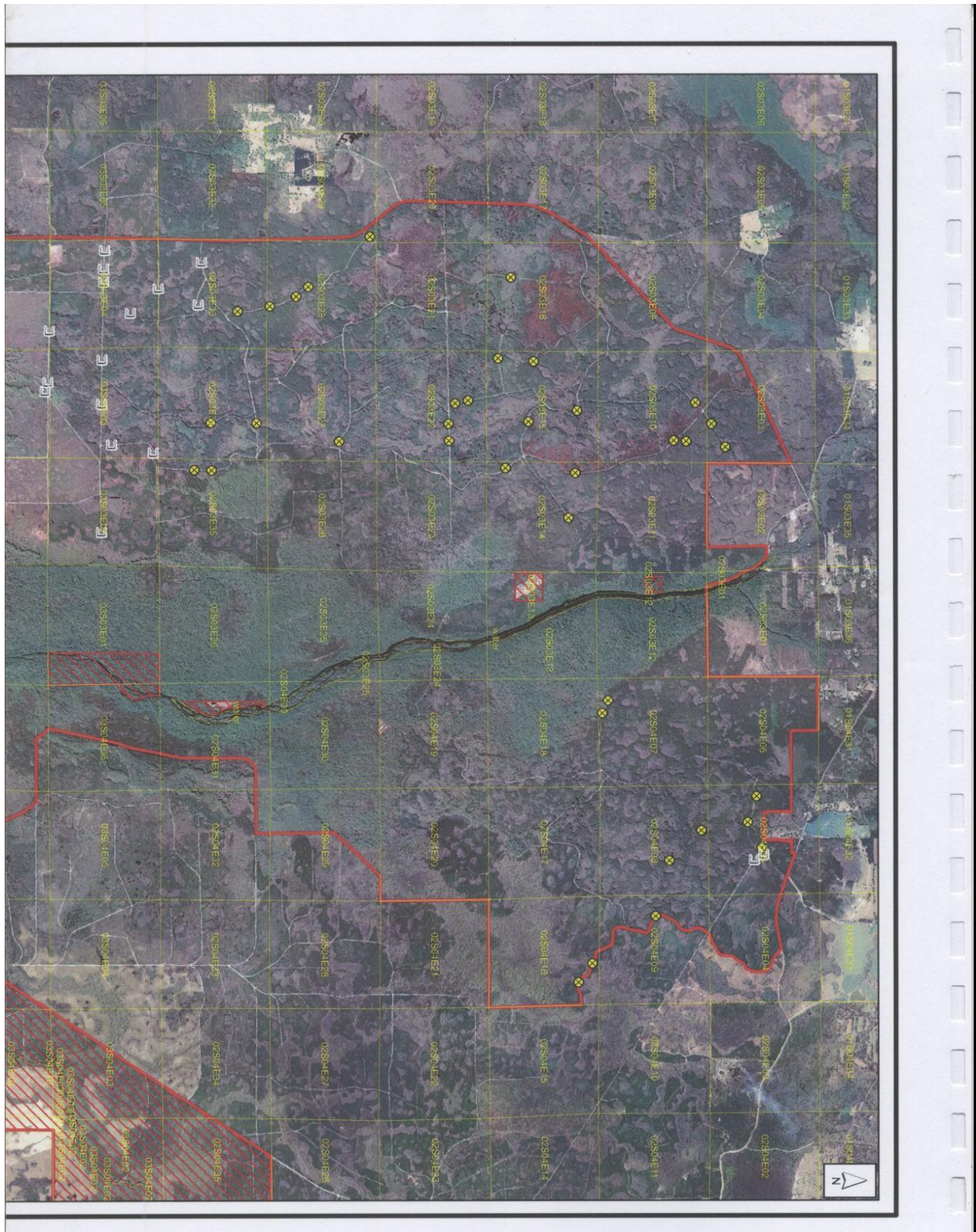
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11.17 Timber Management Plan

**TIMBER MANAGEMENT PLAN FOR
14,003 ± Acres
Of The
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida, USA
FWC 14/15-85**

Submitted to:

**Florida Fish & Wildlife Conservation Commission
Morgan Wilbur, Project Manager
3911 Highway 2321 Road
Panama City, FL 32409**

Submitted by:



**Larson & McGowin, Inc.
10 North Florida St.
Mobile, AL 36607**

May 15, 2015

EXECUTIVE SUMMARY

The Aucilla Wildlife Management Area (AWMA), located in Jefferson and Taylor Counties, Florida, is a unique area that contains special communities, flora and fauna, and natural history. The Florida Fish & Wildlife Conservation Commission (FWWCC), charged with the protection and conservation of areas for the betterment of citizens, is undertaking the conversion of a portion of AWMA from a former intensively managed forestry property to a diverse array of communities more representative of the historical and natural landscape. This restoration is being taken through careful, integral steps founded in science that gradually restore target diversity, structure, and function.

The project area discussed in this timber management plan covers approximately 13,622 $\pm$ acres of pine plantations, 102 $\pm$ acres of natural pine forests, and 279 $\pm$ acres of clearcuts and open areas for a total area of 14,003 $\pm$ acres. The pine timberland is composed primarily of slash pine and loblolly pine plantations, pine-hardwood natural forests. A small portion (153 $\pm$ acres) of the project area is designated as historical wet prairie communities. Another portion (207 $\pm$ acres) is being restored back to an upland hardwood forest. The remaining 13,643 $\pm$ acres are being restored back to longleaf pine and closely associated communities.

Management has been ongoing since the property was assembled and includes prescribed burning, timber thinning, and hydrological restoration. This 15-year timber management plan builds upon these approaches to restore timber stands to longleaf pine, upland hardwood, and wet prairie communities using a suite of silvicultural operations. These silvicultural operations are underpinned by the use of natural processes as a guide to restore these three primary communities. Herbicide operations are discussed in this plan but should only be used as a measure of last resort. Activity planning by year will aid the manager in making critical planning and management decisions. Justifications for each operation as well as for the need for adaptive management to provide flexibility in implementation are presented.

Judicious use of prescribed fire will play an intrinsic role in the success of this timber management plan. In addition, longleaf pine is a key species of implementation for the forested communities, and we present methods and justification through which critical components of its impact on the area at large may be restored. The case for restoration of wet prairies is also presented. Using this timber management plan as a guide will enable those tasked with implementation to begin the gradual conversion of the project area to a natural assemblage of endemic communities across the landscape.

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I. Project Background

Historical Context

Ecosystem restoration goals require comprehensive and adaptive approaches to successfully meet objectives. In many cases, the zeal to restore a forest back to its pre-settlement, “natural” state results in the complete removal of an undesired species and the artificial regeneration of the desired species. This has been the case across the southeastern US as declines in pulp prices among other reasons have caused landowners to look towards a longer-term financial horizon with less inherent risk and greater market flexibility (Johnson and Gjerstad 2006). Changes in management objectives have also evolved to where many show interest in restoring certain plants back to areas where it had been extirpated.

One plant species that receives more prominent attention than ever is longleaf pine (*Pinus palustris* Mill). Longleaf pine was once the king of the southeastern US forests, spanning 90 million acres from Virginia to Texas (Noss 1989, Ware et al. 1993). The longleaf pine ecosystem is the most diverse in the Western Hemisphere outside of the South American tropical rainforest (Noss 1989), and it owes much of this complexity to the interplay of fire and unique vegetative assemblages across the landscape. In addition, the longleaf pine ecosystem affords a greater hunting experience, wildlife diversity, and higher valued timber than that of many other pine species in the region.

When the Europeans arrived in the southeastern US they discovered a vast expanse of trees, an open understory allowing for unfettered travel, and a diverse animal population (Ware et al. 1993). Over the next several hundred years longleaf pine trees were harvested for use in ship masts, the turpentine industry, housing, naval stores, and many other needs. Fire was removed from the landscape largely for liability reasons and for agriculture, and over time the once prolific longleaf pine ecosystem was relegated to 3-4% of its original range (Noss 1989). In addition, longleaf pine was well known to exhibit slower juvenile growth than that of slash (*Pinus elliottii* Engelm.) or loblolly pine (*Pinus taeda* L.); eventually these 2 pine species became the standard of the pine timber industry in the southeastern US. That, coupled with the lack of understanding of regeneration dynamics and the role of natural disturbances, served to reduce the seemingly inexhaustible longleaf pine forests to relatively few, fragmented areas across the landscape.

Longleaf pine forests evolved over the millennia through stochastic natural disturbances that differed greatly over time and space. The most common disturbance in the longleaf pine ecosystem by far was the single lightning strike (Palik and Pederson 1996), which killed a single tree or small group of trees and, in some cases, caused fires that ranged from a few square feet to hundreds of thousands of acres. Light would penetrate the canopy to the ground, and the lower overstory competition would promote survival and growth of longleaf pine seedlings in canopy gaps. Fire—more than any other disturbance—would push back the ecosystem’s successional clock, allowing the understory to greatly diversify and create more conducive conditions for longleaf pine seedlings to regenerate and mature. Other small-scale but frequent disturbances would occur over the landscape and open up slightly more of the canopy.

Large-scale, infrequent disturbances would occur every few years to decades apart, opening large swaths of the canopy and creating tremendous amounts of dead material that would be consumed

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by fire or decompose over time. Under these conditions, mass regeneration events would create expansive areas of single-aged trees. Hurricanes and flooding, especially near the coasts, changed the composition of the landscape at a different scale than that of fires. The direction and intensity of interactions among disturbances were ultimately dependent on biotic and abiotic factors. *The net result of these interactions was a fire-climax ecosystem that was composed of a tree matrix varying in age and structural composition and a highly diverse understory.*

The low-intensity fires that mostly sustained the longleaf pine ecosystem are also part of the larger picture that impacts many of the communities in the project area. For example, wet prairies require very frequent (1-3 years) fire to hold off the invasion of hardwoods such as titi (*Cyrilla racemiflora* L.) and wax myrtle (*Myrica cerifera* L.). Mesic flatwoods, the most common upland community in Florida, is a major component of the area and is maintained by frequent fire every 1-8 years (FNAI 1990). Bereft of fire both communities are quickly invaded by wax myrtle and other hardwoods.

A discussion of the background of the longleaf pine ecosystem is not complete without an examination of the other flora and fauna that make up the landscape. The longleaf pine ecosystem contains the richest assemblage of plant and animal species in the western hemisphere outside of the tropical rainforest of South America (Noss 1989). Many of these species evolved with those segments of the ecosystem that make it so unique. The frequent fire which kept the understory in an early seral stage allowed for robust animal and insect populations with abundant food sources and cover close to the ground. The stochastic disturbances that helped create the variable overstory opened the canopy to many types of avian species. The subsequent configuration of the canopy created microsites suitable for a dizzying array of species that served as predator and prey, cover and perch. Many of the primary animal species are found throughout the southeast, even across the continent. These animals, including the white-tailed deer (*Odocoileus virginianus* Zimm.), wild turkey (*Meleagris gallopavo* Zimm.), and migratory birds are common across wide swaths of environmental and ecosystem gradients—grander in scale, covering hundreds of millions of acres across North America.

However, some species are adapted to a much narrower range of ecosystems. These specialists are only able to tolerate specific and sometimes very narrow conditions in order to survive. Most of these conditions occur naturally with time through climate and weather events, but humans have altered the impact of these events, for better and for worse. The gopher tortoise (*Gopherus polyphemus* Daudin) is a prime example of a species adapted to pine forests of the southeastern US, requiring relatively open forests with ground-level food sources and deep, sandy soils. Though long associated with the longleaf pine ecosystem, the gopher tortoise can be found in forests dominated by other pine species. Its preference for frequently burned longleaf pine forests with well-drained soils has been documented for decades. The population of the gopher tortoise has been on the decline for many years due to habitat loss, human and animal predation, and disease. It was listed as a threatened species under the Endangered Species Act (ESA) in 1987 in part of its range and has received special protection in other regions where it is found. The gopher tortoise is known as a keystone species, with more than 350 documented animal and insect species using its burrows.

There are several dozen additional species that are listed as threatened, endangered, or in peril that are associated with the longleaf pine ecosystem.

Of all the animal species that capture the essence of the longleaf pine ecosystem, the red-cockaded woodpecker (*Picoides borealis* Vieillot) stands alone. Unlike the gopher tortoise that can survive in young as well as old pine forests, the red-cockaded woodpecker (RCW) *requires* mature pine trees, with a strong preference for longleaf pine. It is a unique bird species in that it is one of only two woodpeckers protected under the ESA and the only woodpecker species that nest in live pine trees. It was listed as an endangered species in 1970, three years prior to the passing of the ESA. Once plentiful as recently as 1900, recent estimates of RCW populations are 12,000-15,000 birds in about 6,000 families in an exceedingly limited range. It lives in small families called clusters that contain one breeding pair and up to 4 male helpers (USFWS 2003).

While RCWs do make cavities in pine forests dominated by slash or loblolly pine (especially outside of the longleaf pine's natural range), they favor relatively open, older longleaf pine forests for several reasons:

1. Older trees—RCW nests are carved out of living pines that contain a fungus causing red heart rot. This condition makes the wood softer and easier to excavate. RCW are able to actually detect trees that have cavities created by red heart rot (Rudolph et al. 1995). Once they have created a cavity about 20-50 feet above the ground that can take several years to complete, the RCW will call that place home for many years, maintaining the opening by pecking small holes in the wood below the opening (Conner and O'Halloran 1987). Since pines in the southeastern US are resinous species, these small injuries cause the tree to excrete a resin that retards other animals from scaling the tree and capturing the cavity for their use or predation. Over time the repeated excretions create a whitish hue surrounding the tree. Longleaf pines are well known for their relatively high resin content compared to slash or loblolly pine; therefore, the RCW prefers a pine that can secrete large amounts of resin to protect their nest. Red heart rot occurs in older pines and as young as 40 years of age. Additionally, longleaf pine can live more than twice as long (up to 500 years) as slash and loblolly pine, so the probability of a longleaf pine cavity tree dying is less than other pine species.
2. Open forests—RCW clusters can cover wide areas (up to 60 acres), but their foraging area can be far greater (up to 200 acres). The optimal habitat for RCW clusters is a sparsely spaced longleaf pine forest with a basal area of about 40 ft²/ac with very little to no midstory, especially hardwoods. Reasons that the RCW prefers this open habitat include the overstory trees being likely larger with greater crowns and root systems, which usually equals greater resin flow; younger potential cavity trees; and greater wind resistance.

3. Frequent fire—Similar to that observed with the open habitat, frequent fire results in higher groundcover plant mass which is concomitant with higher insect populations, specifically arthropods (Collins 1998). The open stands also can carry more frequent fire than closed-canopy forests, which perpetuates many of the amenities the RCW so heavily depends upon (USFWS 2003). Frequent fire also helps to maintain the hardwood populations, keeping them at low stature.

At the time of the first drafting of the recovery plan for the RCW in 1979, it was recognized that public agencies would play a crucial role in the initial steps needed to rebuild RCW populations in areas where it had been extirpated or reduced. Notwithstanding the role that private landowners have played with respect to safe harbor agreements and direct involvement with habitat conservation, public lands will continue to be important for helping to meet downlisting and eventual delisting goals.

Ecological Restoration Context

In the effort to restore areas currently used as short-rotation, pine plantations back to communities of pyrogenic longleaf pine savannas many land managers have clearcut thousands of acres of slash pine and loblolly pine, planted longleaf pine, and called it restored. However, consideration must be made for the judicious modification of structure (i.e., assemblages of species, canopies, or fuel loads) and function (i.e., nutrient cycling and regeneration or fire dynamics) while mimicking natural disturbance regimes and acknowledging the inimitable role of time (Mitchell et al. 2006, Palik et al. 2002).

The objectives for the project area lead to several tenets that will be used in this management plan. First, the utilization of existing overstory species can reduce some regeneration and management costs. Second, cultural approaches available to the land manager, e.g., prescribed fire, can mimic natural disturbances in a way that begins to restore function. Third, conducting silvicultural operations over an extended period allow the system to recover, provide a worthwhile revenue stream, and offer a more conservative hedging of bets against climate and market conditions. These tenets work in tandem through time and act as a bridge to restoration of communities and ecosystems (Kirkman et al. 2007).

For the AWMA, the objective of a comprehensive and prescriptive management plan must include an examination of core strata as they relate to the overall objectives of property stewardship.

II. Project Objectives

Overall Management Objectives

The management objectives for the project area include:

- Identify silvicultural systems and prepare management prescriptions detailing treatment regimes at the Management Unit (MU) and stand level
- Identify silvicultural systems that will achieve restoration goals and provide measured revenue from forest products where possible
- Use growth and yield models to estimate future stand development and managed stand yield tables
- Compare predicted results from models with alternative management regimes
- Follow treatments through the rotation of current stands, regeneration harvests, and replacement of timber stands

Short-term Objectives

The project area has a limited palette of pine plantations as well as natural pine and mixed pine areas. As a result stand- or management unit-based approaches must reflect the individuality of a starting point for a stand or management unit and take several factors into account such as:

1. Site characteristics
2. Current and historical cover type
3. Tree size and stocking distributions
4. Understory components, including species richness and/or dominance
5. Management history, including prescribed burns, logging, site preparation, etc.
6. Extent of longleaf pine regeneration

Gradually driving stands toward composition that is primarily longleaf pine can be met using several processes. There are numerous removal options available to a land manager including clearcuts, partial removals through modified shelterwoods, single-tree selection, group selection, or any combination of these. Generally speaking, because of the removal of overstory fine fuel sources the deployment of clearcuts in a restoration area should only be used as a measure of last resort. Open or fallow fields not currently included in the timber GIS inventory can be utilized to help meet restoration goals. However, newly planted stands will need to be treated differently in the first 10-20 years of a restoration schedule than those areas with existing pine overstory. Specifically, restoration stands starting literally at “year zero” may require additional inputs to rehabilitate the understory populations and reintroduce a regular prescribed burn regime.

A cookie cutter approach across all sites, although easy to implement, is not always financially or biologically sound. Short-term objectives for AWMA should be to 1) slowly remove non-target pine and hardwood overstory, 2) establish longleaf pine in the understory (and in recent clearcuts or open areas through artificial or natural means and move these towards release after future harvests, 3) maintain a prescribed burning regime (not part of this timber management plan), and 4) use targeted, “last-resort” herbicide applications only to augment non-target species control and promote development of target species.

Desired Future Conditions

An ecosystem can mean different things to each person. Thus, management approaches to restore and maintain an ecosystem can vary widely among and within properties. Typically the *structure*—that which is seen—is what most people consider as the primary determinant of a community. However, the ability of this structure to sustain and renew itself through natural processes, i.e., its *function*, is no less vital. This management plan enjoins structure and function so that upon full implementation the land manager will achieve their long-term management objectives.

The role of fire and the opening of overstory through harvesting that allow establishment of new cohorts and increased resiliency of the native populations cannot be overstated for this project area. In fact, this approach is in line with the desired future conditions outlined by FFWCC. In the case of frequent, prescribed fire the intention is to mimic natural process that occurred across the project area historically. By conducting these operations the groundcover is kept low in stature with herbs, grasses, and forbs dominant. Also, hardwoods which can directly impact growth of pine regeneration will be of lower prominence. Thus fire—more than any other disturbance—pushes the ecosystem’s successional clock back, allowing the understory to greatly diversify and create more conducive conditions in target areas for pine seedlings to establish. For upland hardwood forests the intention will be to protect these areas from fire.

Some understory species, especially that of the legume family, only flower under certain seasons in which fire occurs (Hiers et al. 2000). In addition, the prevalence of grasses such as wiregrass (*Aristida stricta* Michx.) which, coupled with the overstory pine needlefall, creates a highly pyrogenic fuel and allows fire to move across the landscape in a variety of weather conditions. Even in areas that have been used for industrial forestry means can still have an adequate seed bank of understory plants, so long as some fire has been used (Kirkman et al. 2006, 2007). Bluestem grasses (*Andropogon* spp.) dominate the understory of longleaf pine forests in the western portion of its natural range (Grelen and Duvall 1966), which includes portions of the western Florida panhandle and the project area.

The long-term restoration targets set forth by FFWCC for the project area bring the natural processes found in the longleaf pine ecosystem to bear:

1. “*Creation of spatially heterogeneous management units that include irregular, uneven- or all-aged stands*” – The pre-European longleaf pine landscape was that of an expansive matrix of multi-aged stands, created by stochastic disturbances and masting events (seedfall) that varied in time and space. Mass regeneration of longleaf pine occurred naturally approximately every 7-15 years across the entire range (Boyer 1990). That, coupled with infrequent landscape-scale events such as hurricanes, floods, and tornadoes, served to create stands of varying extent, age, and composition.
2. “*Differentiation into distinct crown classes, size classes and distributions of trees*” – Unlike the large-scale (but infrequent) disturbances noted previously, the more prevalent lightning strike, windthrow, and microburst weather events resulted in the mortality of single or small

numbers of trees (Palik and Pederson 1996). These created natural gaps about 0.1-0.2 acres in size among the matrix of larger openings. The structure of longleaf pine ecosystems are so diverse that it has even been described as consisting of “gaps in a gappy forest” (McGuire et al. 2001). In frequently burned areas, seedlings in gaps further from the edge are selected due to an interaction between fire, light, and competition above- and belowground (Palik et al. 1997, Battaglia et al. 2003, Palik et al. 2003, Pecot et al. 2007, Jack et al. 2010, Iacona et al. 2012). As a result, crown differentiation begins as early as the juvenile (“rocket”) stage and allows gaps to naturally fill over time. Regeneration beneath the overstory matrix also serves as advanced regeneration when small-scale, frequent disturbances occur. As a result of these effects, over time the diameter distribution of older natural longleaf pine forests resembles a reverse j-shaped curve with a slight hump in the smaller diameter trees (Boyer 1990).

3. *“Conversion of pure stands to ones of mixed species, composed primarily of longleaf pines”* – One will notice immediately in a natural longleaf pine ecosystem that, while the vast majority of the overstory is longleaf pine, it is by no means exclusive. Hardwoods, for example, are well known to occur in the midstory—sometimes in the overstory—and provide a valuable wildlife food source or cover. Though frequent fire keeps many hardwoods low in stature, niche differentiation belowground between the understory and hardwoods as well as altered microsite fire regimes allows them to persist across the landscape (Jacqmain et al. 1999). In areas that consist of other pine species, e.g., slash pine, the gradual conversion to longleaf pine ecosystems can occur through prescribed fire, selective harvest methods, artificial regeneration, and mechanical and chemical control of hardwoods (Kirkman et al. 2007, Boyer 1993). Through the retention of a pine overstory over time, an adequate fuel supply is maintained to sustain fire and the understory plant stature and diversity. An important caveat to remember throughout this management plan is there is no analogue for time. Thus, the measured change in species composition from one pine species to longleaf pine occurs over an extended period, requires patience and planning, and uses existing pine and understory species where possible to sustain fire. The basal area of the original pine species is reduced with further timber harvesting, allowing the longleaf pine regeneration to take its place and the prescribed fire regime to persist.

4. *“Perpetual regeneration of fire-maintained forest stands”* – Longleaf pine masting events can be quite prolific. Estimates as high as 435,000 seedlings per acre have been documented (K. Larson, *personal communication*). However, the successful regeneration of longleaf pine can be sustained with frequent fire that exposes the mineral layer of the soil prior to seedfall, keeps the understory low in stature, and controls disease that in some cases can injure or kill seedlings. The grass stage can vary from 2 to as long as 20 years, with an average of 5 to 7 years (Boyer 1990). The time variation in the length of the grass stage is due to site, overstory abundance, abiotic factors, fire, etc. Once established competition with other seedlings, overstory, hardwoods, and understory can impact survival and growth with the highest growth response in relatively open areas, i.e., gaps (Brockway et al. 2005, Palik et al. 2003, McGuire et al. 2001). However, facilitation with the overstory during drought has been known to occur (Pecot et al. 2007). Thus, a dynamic balance between seedling growth and

survival constantly takes place in longleaf pine forests and is driven by overstory abundance and structure as well as fire. Though large-group selection or clearcuts may technically result in the highest growth per seedling (relative to areas with higher overstory basal area), one must consider the ramifications of this approach on fire, hardwood competition, and understory dynamics.

The restoration of critical ecosystem components in longleaf pine forests must include a sustained measure of prescribed fire operations. In many areas prescribed fire has continued relatively unabated for decades. In some regions development and population growth has increased the pressure on the ability to conduct regular prescribed burns. In areas that have been long unburned, the reintroduction of fire must be met with extreme caution and undying patience. A slow, methodical addition of fire regimes to a site will reduce the acute physiological stress that can occur in mature root systems (O'Brien et al. 2010). Fortunately, much of the subject area on AWMA has, for the most part, had a more active burn regime relative to similar sites across the southeastern US.

With reference sites demonstrating desired future conditions (DFC) located on Apalachicola National Forest, management approaches taken in the first decade of the management plan can be easily quantified in terms of success. There are numerous examples of restoration and conservation in the immediate geographic area surrounding AWMA. Active programs to restore longleaf pine communities have been in place on the 632,000-acre Apalachicola National Forest for several decades. Other programs are occurring at the 68,000-acre St. Mark's Wildlife Refuge, the 11,200-ac Box-R WMA, and the 86,140-ac Apalachicola River Wildlife and Environmental Area (ARWEA). The last 2 properties implemented management plans in 2010 and 2014 respectively that are very similar in approach to that of the subject area. Lessons learned from restoration processes on Box-R WMA and ARWEA should serve as an immediate and effective guide to management objectives implemented on AWMA.

Using dynamic frameworks to assess goals and work completed is crucial when conducting restoration, especially on sites where the reference condition itself continues to evolve (Kirkman et al. 2013). In other words, in tracking the restoration progress of a longleaf pine ecosystem it is critical to understand that spatial and temporal variation is occurring in the reference condition itself. The DFCs in each of the critical communities on AWMA for the management plan (mesic flatwoods, scrubby flatwoods, wet flatwoods, and wet prairie) will have unique combinations of management objectives, costs, and flexibility that must be closely tracked vis-à-vis their reference sites to measure success.

A "restored" longleaf pine ecosystem includes components that lend to its structure *and* function so that management approaches mimicking natural disturbances retain it. In addition, many of the components being sought can also be used to maintain or promote RCW habitat. The following are general attributes of what could be considered a fully functioning longleaf pine ecosystem; each natural community provides "ecological sway" with respect to each component. It is important to note that some conditions listed below may vary slightly if RCW management is included. Variation in these conditions will impart slightly different management approaches in areas designated as

RCW foraging area. Based on Larson & McGowin's experience, the following criteria can be used as attributes of a well-functioning, naturally sustainable longleaf pine ecosystem:

1. Structure
 - a. A relatively open overstory, primarily longleaf pine of different age and size class with the *majority* of stands between 30-70 ft²/ac of overstory basal area depending on site and local conditions but also containing other sparse pine species
 - b. Midstory composed of longleaf pine growing into the overstory and very sparse hardwoods
 - c. A diverse understory made of grasses, forbs, legumes, hardwoods, and longleaf pine regeneration (Kirkman et al. 2004)
 - d. All structural components vary across time and space, creating a matrix of ages, size, and density
2. Function
 - a. Management that uses frequent fire (approximately every 1-3 years, depending on site) to retain the understory, prevent the progression of hardwoods into the midstory, and create ample suitable sites for longleaf pine regeneration after masting events or planting
 - b. Management in wet prairies that utilize very frequent (1-3 years) fire to hold off the invasion of hardwoods such as titi (*Cyrilla racemiflora* L.) and wax myrtle (*Myrica cerifera* L.)
 - c. Management approaches that use mechanical or chemical means to control hardwoods used extremely judiciously to prevent damage to the understory and regeneration
 - d. A prevalent, grass-dominated understory that, along with other plants and longleaf pine needlefall, contributes to a continuous movement of fire across the landscape
 - e. Legumes that allow for N fixation to replenish N volatilized in aboveground plant material after fire
 - f. Understory and midstory that creates suitable wildlife cover and food sources for ground-nesting animals and mammals
 - g. Retention of unique longleaf pines, e.g., those that contain "witch brooms", to create wildlife cover in the overstory canopy
 - h. The buffering of natural disturbances across the landscape, i.e., one disturbance does not destroy an entire forest

Adaptive Management Principles

As part of this management plan alternatives are always at the ready should conditions change on the ground. As an example, the ability for a management unit or stand to be harvested may depend on regional factors (hurricanes, drought, mill supply and demand) or local factors (accessibility of the area to be logged, hunting season) that change through space and time. Adaptive management, i.e., learning by doing, is necessary for the effective implementation of forest management. It will be critical that persons responsible for plan execution be aware of any contingencies. Adhering *only* to

the proposed activity schedule may invite issues with long-term objectives and restoration targets. In other words, it is paramount that scheduled activities be put in context of on-the-ground conditions.

The caveat to this entire management plan is that while operational costs may remain fairly static across the 15-year operational window presented, any income through harvesting may vary widely with market conditions. Moreover, yield estimates and financial analyses presented are only valid for a particular stand *at that moment in time*. Altering the harvest schedule across years would require further analysis to pinpoint any changes in price assumptions or yield estimates.

III. The Property

Description

All subsequent descriptions of AWMA in this management plan refer to these the 13,724 ± acres of pine-dominated forest stands found within the property and the 279 ± acres of open and clearcut areas (Figures 1 and 2). Historically the area was likely dominated by longleaf pine in the flatwoods and uplands and cypress, bay, tupelo, and other hardwoods in the wetter sites. In the 19th and early 20th century much of the region was logged for longleaf pine and bald cypress (*Taxodium distichum* [L.] Rich.). Some of the remaining longleaf pine likely supported the naval stores and turpentine industries that remained active in the area until the mid-20th century. Like much of the region, after these anthropogenic disturbances the natural fire intervals were altered such that hardwoods invaded some areas formerly maintained by frequent fire. That, coupled with the shift to more intensive, short-rotation forestry and a general lack of understanding of longleaf pine dynamics, caused a decline in longleaf pine forests on the property and across the entire southeastern US.

American Indian history is rich in the area, with the region being possibly used by the Apalachicola, Ais, Chatot, and Tawasa tribes among others. There are shell mounds on the property, the result of mollusk shells and aboriginal garbage collected in concentrated form. These communities are alkaline in nature, drain very rapidly, and have high organic matter content. Though they are anthropogenically created, shell mounds are designated as a unique plant community and extremely valuable as archaeological sources (FNAI 1990).

The property's proximity to major cities (Tallahassee, FL), important natural areas such as Apalachee Bay and Apalachicola National Forest, and its multiple uses creates an arrangement of sites suitable to anglers, hunters, hikers, cyclists, birdwatchers, and many other interests.

Historical Property Management

Pre-European inhabitants occupied the area around the Aucilla River as far back as 12,000 years before present. The pre-European climate was drier, and the region around AWMA contained several limestone sinkholes which were used as a central point for hunting large game. In 1993 a University of Florida archaeologist discovered a large Mastodon tusk along the Aucilla River which had evidence of human involvement. Radiocarbon dating revealed the tusk to be 12,200 years old.

Two ceremonial Indian mounds were discovered in the AWMA region in the early 1900s. They were associated with the Weedon Island Culture. Much of the property was logged for giant cypress in the early 1900s by timber companies who built raised tram beds to haul the large logs.

In 1988 the core area of AWMA comprising 14,000 acres was acquired by the state of Florida. Additional acreage was added through purchases from St. Joe Paper Company in 2000 and 2003. The property is held in fee simple title and subject to any mineral holdings owned by previous ownership.

Current Property Conditions

Year-round access is allowed for hiking, biking, horseback riders, boats, etc. Today the property is managed as a wildlife management area focused on conservation of fish and wildlife resources and their recreational uses. Though the property has been extensively logged it is nonetheless undeveloped from a modern standpoint and unique among many of the coastal areas of Florida.

According to a recent Florida Natural Areas Inventory (FNAI) survey, 13 historical plant communities currently exist on AWMA germane to this management plan, i.e., the project area: basin marsh, basin swamp, baygall, depression marsh, dome swamp, floodplain swamp, hydric hammock, mesic flatwoods, ruderal, scrubby flatwoods, upland hardwood forest, wet flatwoods, and wet prairie. FNAI (1990) provides an excellent source of information regarding these communities. In many of these communities fire is a keystone process that maintains ecotones. However, other factors influence these boundaries including climate, hydrology, soils, species composition, and man-made structures such as roads and firebreaks.

In the context of the management objectives and long-term restoration guidelines, the current plant communities are a basis for moving back to the natural communities that may have occurred on the property prior to anthropogenic forces. Five of these communities make up 94% of the project area: baygall (8%), hydric hammock (2%), mesic flatwoods (60%), upland hardwood forest (2%), wet flatwoods (23%), and wet prairie (1%). The remaining natural communities occur in isolated pockets. Each of these plant communities has numerous unique characteristics (FNAI 1990). Obviously, any active management must address the fact that these benchmark communities have a place on the property to best meet long-term restoration objectives.

The focus of this management plan is on restoration of historical flatwoods, upland hardwood forests, and wet prairie sites, comprising the vast majority of the acreage on the subject property area. Wet prairies are generally treeless plains, and flatwoods sites are historically dominated by multi-aged longleaf pine ecosystems. In both cases, fire will play a crucial role in restoration and maintenance that cannot be overstated moving forward. Upland hardwood forests are structurally complex, closed-canopy forests that are dominated by deciduous trees and with protection from fire. MU 21 contains the majority of the acreage where upland hardwood forests will be maintained. Other major communities are related in substantive and functional ways to these two key natural

communities and restored indirectly as a result of work performed to restore these benchmark communities.

IV. Project Methodologies

Project Area Description

The project area covers approximately 14,003 $\pm$ acres scattered across the property. The core areas included in this plan are currently designated as pine timberlands in various stages of development and type as well as recently clearcut or open areas. They are divided into 3 strata (pine plantation, natural pine, and pine-hardwood mix) as a starting basis of this management plan. Within these strata type a further designation is necessary for restoration purposes: a portion will move towards longleaf pine and upland hardwood forest and the remaining towards wet prairie. All pine stands are dominated by slash and loblolly pine with other overstory pine species (such as longleaf pine) scattered across the landscape. There are 279 acres of clearcuts or open areas that will be assigned to move towards longleaf pine. A small portion (MU 21, 207 $\pm$ acres) will be left to grow on its own without fire: this is the upland hardwood forest trajectory. The total proportion of each stratum within the core project area and across all AWMA timber management units is provided in Table 1. A map of management units and current cover types on the subject property are provided in Figure 1 and 2, respectively. Maps of current stand ages, density (TPA), and stocking (BA) based on a 2014 inventory are provided in Figures 3 through 5, respectively.

Spatially, the project area is divided into 33 management units (Figure 1). Historically, some areas of the property were found by a recent FNAI survey to be historically wet prairie in portions of MU 9 and 18. The vast majority of these sites in MU 18 are designated as future wet prairie restoration sites (Figure 7). A summary of management units provided by FFWCC with the total and pine acreage, cover type, and general observations is provided in Table 2.

The project area includes pine plantations of various ages with pockets of younger stands. Slash pine stands dominate the landscape, comprising 90% of the project area with ages between 16 and 57 years. Loblolly pine-dominated stands are found on 3% of the project area with a range of ages from 21 to 43 years. The natural and mixed pine stands range in levels of maturity and stocking, but most are older than 25 years of age. Several of the pine plantations were bedded at the time of planting. That, coupled with their soils and location, has resulted in standing water between rows for several months out of the year.

The understory is robust in the project area and is made up of many species of hardwoods, shrubs, forbs, grasses, and herbs. Swamp titi (*Cyrilla racemiflora* L.), wax myrtle (*Myrica cerifera* L.), live oak (*Quercus virginiana* Mill.), cabbage palm (*Sabal palmetto* [Walt.] Lodd.), red maple (*Acer rubrum* L.), swamp bay (*Persea palustris* [Raf.] Sarg.), and sweetgum (*Liquidambar styraciflua* L.) are many of the plant associates in the under- and midstory of the area.

Prescribed fire was sporadic across much of the project area for many decades. As a result, many herbaceous plants have been relegated to a smaller portion of the landscape than probably historically occurred. Prescribed fire, however, has been an active part of the silvicultural operations on the project area for several years. We applaud the property manager's efforts to prescribe burn as much of the pine stands as possible.

Many of the existing pine plantations were planted at about 600-650 trees per acre. Of these, approximately $4,200 \pm$ acres received ground or aerially applied fertilizer amendments at some point. The 2 fertilizers used were triple super phosphate (TSP) and diammonium phosphate (DAP). Most fertilization treatments likely occurred at the time of planting and mid-rotation.

Natural and mixed pine-hardwood stands are also located on the project area. These areas were likely burned very frequently for wildlife and presumably had a smaller hardwood component than that found today.

MU 21 is designated as a historically upland hardwood forest. This community type is exemplified by a structurally diverse, hardwood-dominated canopy that is protected from fire. Species vary depending on location; the more prevalent species are southern magnolia (*Magnolia grandiflora* L.), Florida maple (*Acer saccharum* var. *floridanum*), sweetgum (*Liquidambar styraciflua* L.), white ash (*Fraxinus americana* L.), and loblolly pine. Flowering dogwood (*Cornus florida* L.), eastern redbud (*Cercis canadensis* L.), and red bay (*Persea borbonia* L. [Spreng]) are some of the common midstory species. The understory in upland hardwood forests are dominated by more shade-tolerant herbs and forbs than that of the historical pine-dominated areas and include species such as partridgeberry (*Mitella repens* L.), Virginia creeper (*Parthenocissus quinquefolia* L. [Planch.]), sedges (*Carex* spp.), and trilliums (*Trillium* spp.).

The soils of the project area vary across the entire acreage. Over 99% of the project area consists of 8 major soil series: Chaires, Nuttall, Tooles, Leon, Rutledge, Surrency, Chiefland, and Ortega. These soils range from very poorly drained loamy sands (Surrency Series) to poorly drained sands (Chaires and Leon Series) and fine loam (Nuttall and Tooles Series) to moderately well drained sandy (Ortega Series) and well drained loamy (Chiefland Series) soils. All are on very low to low slopes. Soils in MU 21 are of the Lutterloh Series, a somewhat poorly drained loam.

Data Provided by FFWCC

The following spatial and/or tabular data were provided by FFWCC in a supplemental CD and used by Larson & McGowin for creation of this management plan:

- 1) *FNAI Community Mapping data* – Two sets of community data were provided. The first was a map (and associated data) of natural community boundaries and extents using aerial photographs from 1953. Second was a survey of current community boundaries.
- 2) *Inventory of Project Area*—these data were collected and compiled recently by The Forestry Company. A 10x10-chain grid (660x660 feet) was established across all pine stands in order to measure all pine trees greater than or equal to 4 inches diameter at breast height (dbh) or

greater. A 10 basal area factor (BAF) prism with variable plot radius was used to tally every tree within each plot. Each tree was assigned an end product (pulpwood, chip-n-saw, sawtimber, or poles). In addition, a 1/100th acre plot was established at plot center to measure the number of “free to grow” stems. Submerchantable trees, i.e., 3.5” dbh and smaller were tallied and heights estimated. Finally, reproduction was tallied for all loblolly and slash pine stems between 1 and 4.5 feet in height and all longleaf pine stems less than 4.5 feet in height. Site index was measured on every 5th plot. The survey was completed in May 2014 and exported to a final shapefile for use by FFWCC staff and this management plan.

- 3) *Management Unit Map of Property*-these data included specific information about each management unit on the property.
- 4) *Management Unit Table of Property*-similar to the management unit map, but in shapefile format.

Data Acquired by Larson & McGowin

The following data sources were accessed by Larson & McGowin during the normal course of preparation of this management plan:

- 1) *Soils Data*-from the Soil Data Mart, USDA-NRCS
- 2) *Topographic Images*-from USDA NRCS
- 3) *Aerial Imagery*-USDA NAIP imagery, 2013
- 4) *Miscellaneous Information*-Larson & McGowin requested and received various additional pieces of information, including general history of the property.

Timeline

This project was conducted in several phases and began in mid-March 2015.

Phase 1 (Data QA/QC and Integration) – In the first phase we compiled all available information on the supplemental CD and conducted an initial data quality assurance/quality control (QA/QC) check. This included confirmation of spatial and tabular data integrity, area calculations, and map projections using ArcView 9.3.1. All data was then brought into a Geographic Information System (GIS). Remaining tabular data were checked with their respective application (Excel, Word, etc.). The 142 clearcut acres in MU 27 and 126 clearcut acres in MU 28 were not in the GIS, but for the purposes of schedule development these were given the stand names 27z and 28z, respectively. A Larson & McGowin employee interviewed the local timber market experts to gauge regional market strength and gather local market pricing information. Of course, timber markets are somewhat cyclical and experience seasonal variation so actual sales prices may differ from our assumptions on a year-to-year basis.

Phase 2 (Growth & Yield Analysis and Harvest Scheduling) – A Geospatial Analyst was assigned the duty of examining cruise data in depth and analyze growth and yield data. All assumptions were quantified that were used in growth and economic analysis. Upon data review and

clarification of current and future management the analysis phase of the project began. A determination was made of the most appropriate harvest schedule modeling technique and additional data required to provide reliable results. The data used to make these analyses were derived from several recent inventory sources of the project area provided by FFWCC.

Phase 3 (Output Generation) – Harvest analysis, stand tables, and activity scheduling spreadsheets were created at a stand and management unit level. A series of maps were created that detailed overstory harvest and artificial regeneration activities. Finally, these data were used in development of this management plan.

Geospatial Analysis

Stand-level polygon vector data were combined with pre-compiled cruise data, both provided by FFWCC, in order to fine tune starting inventory estimates and confirm site index (base age 25 years) estimates. In addition, GIS analysis was performed to determine if any existing stands should be split into new polygons based on available data. None were found for the project area so GIS stand data boundaries were left intact. All stands had their property name added to the beginning of the stand name to keep better track during subsequent analysis, e.g., stand 2 became “AWMA_2”. Acreages and extents were recalculated in the GIS and a finalized shapefile created and reimported into the geodatabase provided by FFWCC. Once the stand polygon layer was finalized, tree and plot-level inventory data were recomputed to the stand level using plotted GPS locations for these inventory points provided by FFWCC.

Growth and Yield/Harvest Scheduling

Plantations - Planted pine stands were deemed the most important and given the vast amount of attention with regard to harvest scheduling in this project. This is because according to area and volume estimates from the FFWCC-supplied cruise 90% of the project area was in planted slash pine and 7% in planted loblolly pine. Only 1.5% of the project area consisted of stands that were comprised of planted pine mix, natural loblolly, or open areas (fire-damaged or clearcuts). The natural pine stands were also mature in that they were not in transition from a pre-merchantable to a merchantable condition; thus, inventory estimates could be more simply grown to estimate future growth and yield.

Natural and Mixed Pine - Natural stand growth methods took advantage of the merchantable state of natural stands, which included natural pine and pine-hardwood stands, by applying volumetric growth percentages. These percentages varied by stand condition as a natural slash pine yield equation (Bennett 1980) was used to derive these percentages for all pine material in these natural areas using age, site index, and basal area inputs. Using these pine growth proportions as a guide, hardwood proportions were next derived using hardwood to natural slash pine volumetric proportions as seen in McClure and Knight (1984). These values, as expected, showed hardwood volumetric growth rates that never approached the rates noted for natural slash pine and they were calculated separately for various stand ages. Once these growth percentages were found, they were

applied to by-product weights that were recompiled at the stand level. Using these projected yield estimates harvest prescriptions were made within the 15-year window where little slash plantation-based income was expected in order to accentuate anticipated low income years. These stands were also reviewed to determine if interplanting of longleaf pine could occur over the 15-year window, independent of any harvesting. Fifteen stands covering 1,866 acres had current stand basal area of 35 ft²/ac or less and were deemed as being available for planting regardless of any future harvest.

Upland Hardwood Forests – For the upland hardwood forests in MU 21 we opted to allow the forest to simply grow with no inputs from a silvicultural standpoint. These sites still have a significant component of mature loblolly pine; however, these will gradually be replaced by the more shade-tolerant hardwoods in the upper canopy.

Harvest Scheduling – For the plantations and the natural/mixed pine strata automated growth and yield methods were applied to predict economically optimized slash and loblolly pine thinning regimes in order to provide income for other timber management activities while meeting final stand density constraints for a 15-year conversion period. This growth and yield protocol (*sensu* Pienaar et al. 1996) is a stand-level method that uses input stand tables, except in young pre-merchantable stand situations, and generates grown stand tables. In defining input stand tables at the stand level for the plantations to be modeled, plot locations were tied back to individual plantation stands using ArcMap and the inventory information was recompiled to create these input tables.

The merchandizing protocol is one that handles numerous products. In this case, five categories were used (pulpwood, chip-n-saw, small sawtimber, large sawtimber, and poles) corresponding to the planted pine products used in the cruise supplied by FFWCC. The per-ton prices associated with these products were initialized at \$13.77 for pulpwood, \$21.17 for chip-n-saw, \$28.12 for sawtimber, and \$60.00 for poles (Timber Mart-South estimate, 1stQ 2007-1stQ 2014, accessed March 29, 2014). Based on conversations with a regional expert in wood markets (*Ben Powell, The Woodland Company, pers. comm.*) and internal expertise, Larson & McGowin made the decision to use these start prices at year 0 with a return to long-term averages over the first 5 years of the harvest schedule, with subsequent years static in price. The percent price increases for years 1-5 of the harvest schedule were 1.01% for pulpwood, 2.12% for chip-n-saw, and 2.71% for sawtimber. Pine pole markets are typically stochastic, so the price throughout the 15-year window of the harvest schedule was kept at \$60/ton. A discount rate of 7% was also used. Actual pricing will differ from our estimates based on sale timing and the cyclical nature of the markets.

A schedule of timber harvests using a combination of species-centric tree growth models, harvest regime and pricing parameters, spatial analysis, and linear or nonlinear problem solving is often referred to as a “harvest schedule”. In general, a harvest schedule model:

- Inputs the current attributes for a set of stands;
- Simulates growth over time without any timber harvests as a management baseline;
- Simulates growth over time with a matrix of timber harvests (modulated by time, removal pattern, pricing, and costs);

- Calculates the financial value of a timber stand at a consistent point in time (net present value or NPV) with all timber harvesting matrices;
- Optimize on any input constraint, be it NPV, timber harvests, management costs, endangered species management, ecological attributes, etc. using a linear/nonlinear problem solver; and
- Output an annual schedule of timber harvests that estimate growth and removals based on all aforementioned inputs

Larson & McGowin uses a custom solution developed within the company for generating a harvest schedule. This approach, called “THOR” (The Harvest Optimizer), uses published growth models within open-source programming languages (R¹ and GLPK²) to analyze the data and prepare a harvest schedule.

For AWMA the project area was divided into two distinct datasets. For the purposes of distinction these are referred to in this plan as the “longleaf pine restoration objective” and the “wet prairie restoration objective”. These two restoration trajectories were designated using GIS analysis and historical FNAI inventory data. A total of 117 stands covering 13,545 acres $\pm$ were designated as the longleaf pine restoration objective dataset, and a total of 3 stands (MU 18) covering 153 acres $\pm$ were designated as the wet prairie restoration objective dataset.

The longleaf pine restoration objective stands were further divided into data subsets based on the current stand basal area in order to provide pragmatic harvest options for each stand. Total stand basal areas of 35 and 70 ft²/ac were set as thresholds for data subsets. Fifteen stands (1,928 acres) had basal areas <35 ft²/ac and were not run in THOR as they were deemed ready for planting operations with no future timber harvests necessary. Sixty-four stands (7,827 acres) were between 35-70 ft²/ac of basal area (THOR analysis 1-13), and 38 stands (3,840 acres) $\geq$ 70 ft²/ac of basal area (THOR analysis 1-23/1-33). A total of 37 and 31 regimes were defined for the longleaf pine restoration objective for analyses 1-13 and 1-23/1-33, respectively. With these regimes we tested for various thinning options in the 15-year window of interest (to 70, 50, or 30 ft²/ac of residual overstory basal area) in order to meet planting objectives.

Three stands (153 acres) were run through the wet prairie objective regimes (THOR analysis 1-11). Fifteen regimes were applied to these stands, all with a final clearcut. No post-harvest planting occurred in the wet prairie objective stands as this natural community was a historically treeless plain maintained by frequent fire.

Using the aforementioned thinning regimes applied to each pine stand in conjunction with the 15-year term and economic values given, the regime/stand combination that produced the highest NPV was designated as optimal and output for planning considerations. This “unconstrained” model provided a starting point to determine where any constraints on harvesting activities would be beneficial operationally. A second approach to maximize NPV while adjusting timing of harvests

¹ R is maintained by CRAN (Comprehensive R Archive Network)

² GLPK (GNU Linear Programming Kit) is written in C and maintained by the GNU Project

and allowing the stands to run to financial maturity (not restricted to the 15-year conversion window) was generated. For THOR analysis 1-13 we constrained the linear problem model to 13,000 total tons per year for the 15-year conversion window. For THOR analysis 1-23 we constrained total tons to 10,000 per year. Both constraints were used to prevent the heavy thinning in the first several years observed during the unconstrained runs, creating an untenable schedule of thinning operations. All remaining years were allowed to run unconstrained. This approach smoothed the number of acres—and thus tons removed from thinning—over the initial 15-year period.

For the wet prairie restoration areas the unconstrained model clearcut much of the area within the first 2 years of the harvest schedule. We created a more operationally feasible approach by forcing the candidate clearcuts to be several years in the future. As there were only 3 stands the model was left as unconstrained. Stand and stock tables for these final results were generated. Results from both analyses (longleaf pine and wet prairie restoration objectives) were combined into the GIS and summary tables.

Operational Activities GIS Merge – To assign operationally feasible harvest prescriptions we examined the harvest schedule results spatially in the GIS. Though not part of this timber management plan we accounted for the need to perform prescribed burn operations in areas scheduled for thinning and planting. Using our best judgment we modified some of the thinning schedules so that adjacent stands were not thinned too close together in time and not so far off that a general prescribed burn schedule would be impacted. A similar approach was used with assigning planting years. This would provide flexibility to the property manager so that underplanting could occur after one or more prescribed burn operations. By delaying planting operations a year or two the site could have additional time to recover with respect to groundcover and overstory fuel sources.

15-year Schedule of Activities

A 15-year schedule of activities was created using the harvest schedule outputs and finalized GIS data that covered up to two thinning operations and planting of containerized longleaf pine seedlings. Operational costs were based on Larson & McGowin's knowledge of standard forestry practices in the region, including \$200/ac for planting operations for containerized longleaf pine seedlings. Justification and detailed descriptions for silvicultural operations are provided in the section entitled "Silvicultural Recommendations". In all cases the cost assumption is that the respective contractor(s) will be fully insured and adequately trained for the task at hand. Depending on labor, equipment used, complexity, and year this cost may vary. Estimates of cash flow should be considered a general guide for use in management planning. Actual income and cost estimates will vary depending on the specific timber stands being harvested, market conditions at the time the sale is negotiated, and other factors.

Silvicultural operations were assigned to individual stands so that total prices could be estimated for development of the 15-year activities schedule. Stand acres were multiplied by the respective

operational cost to determine the total cost by year and then summed. A comparison of an optimized harvest schedule over a longer timeframe was generated to achieve similar results (not included). Upon discussion the decision was made to place operational constraints on the analysis to shorten the harvest period to 15 years.

V. Silvicultural Objectives

Operations Employed

In this section the silvicultural options to be used in this management plan are discussed to provide a framework and justification for specific operations at the management unit and stand level. Each of these options lends themselves to the long-term objectives as set by FFWCC.

Overstory Harvesting – The project area contains primarily slash pine plantations with a relatively small loblolly pine component. There are also sites designated as pine stands that possibly naturally regenerated after harvesting or were planted and left to grow after one or more previous thinning operations. Some of these areas also include a heavy hardwood component and are designated as a pine-hardwood mixture.

The long-term restoration targets are the same in all stands with the longleaf pine restoration objective; however, the intensity of the change will vary across the project area. The trajectory includes the harvesting of current pine overstory and the subsequent underplanting of longleaf pine seedlings once conditions are met, the latter of which will be covered in the next section.

The wet prairie restoration targets are the complete removal of all overstory with the maintenance of the site through frequent prescribed fire. No longleaf pine planting should occur after any harvests in the wet prairie restoration areas. The prescribed burning operations have been covered in the previous section.

The harvesting of pine plantations will consist of overstory thinnings that will either result in one or two thinning operations over time. In general (specific recommendations are at the stand level), the approach for the pine plantations is to conduct a marked or operator-select thinning that reduces the basal area back to approximately 70 or 50 ft²/ac and/or a second cut to reduce the basal area to approximately 30 ft²/ac. A yearly summary of estimated acres and revenue for overstory harvesting operations is provided in Table 3. A summary of each stand to receive harvesting treatments are provided in Tables 4 through 7, and maps are provided in Figures 8 through 11.

In harvesting operations longleaf pine should *always* be retained if present. This serves to create a more heterogeneous stand of target overstory species, can allow for natural regeneration to occur, and will more quickly create habitat suitable for endangered species such as RCW which favor older longleaf pine.

Harvests to 70 ft²/ac of residual basal area can be accomplished through third-row thinning with operator-select between the rows or by marking individual trees for removal. With both approaches

the gradual movement towards multiple age cohorts can begin. However, by marking specific trees for removal at this thin operation one can remove trees of poor vigor. This raises the overall health of the residual stand and helps with fire continuity. In addition the person marking the timber may begin to plan for the next thinning at this time by choosing areas to be opened where fine fuel sources are in relatively good shape. As seedlings are not planted after this thin operation the key is to not make harvested areas too large such that fire continuity is affected. One wants to be able to continue to burn in these stands until the 30 ft²/ac basal area thinning operation.

Harvests to 50 or 30 ft²/ac of residual basal area should occur over the entire stand's area and allow for generally circular overstory gaps that are no larger than approximately 0.3 acres with no less than 100 feet of intact canopy between openings. In general the optimal size would be in the 0.1-0.25 acre range (~75-120 feet in diameter). Gaps created are planted such that advanced regeneration establishes. Any existing mature longleaf pine should always be favored as they can provide a source of natural regeneration which reduces planting costs. The person who marks the trees to be removed can also use single-tree in addition to small group selection. This would need to be made on a case-by-case basis. Single-tree selection can make large enough overstory gaps to allow for seedling development. This type of selection also has the added positive effect of keeping fire continuity high relative to larger group selection or clearcuts.

With subsequent thinning operations the gaps can be widened slightly provided enough longleaf pine regeneration is present. This can be accomplished with single-tree selection along the gap perimeter. The property manager should use a threshold of ~400 trees per acre (approximately 10' by 10' spacing) of longleaf pine regeneration as the marker for enlarging an existing opening. This is not a hard-and-fast threshold; experience should always guide whether more or less regeneration is suitable for a particular site. If there is not a suitable level of regeneration present in a gap at that time it is suggested to 1) enlarge a different gap with adequate regeneration or 2) create a small opening somewhere else in the stand, followed by planting in these areas. For gaps without adequate regeneration we suggest augmenting these areas with seedlings when the next planting operation occurs. Planting is only described here for clarity; details will be covered in a later section.

In general harvests to 70 or 50 ft²/ac total residual basal area may be easier than that of 30 ft²/ac because there is higher stocking available for manipulation. Reducing the basal area to 30 ft²/ac should only occur when groundcover and advanced regeneration is adequate to maintain fire continuity. Marking a stand to this basal area can be accomplished either through operator-select methods or by the property manager.

The person responsible for marking the timber should know the long-term objectives of the project area which include creating horizontal and vertical structure. In many cases this can simply be done by choosing a variety of tree sizes that will create a more uneven-aged structure, evidenced by a reverse J-shaped diameter distribution curve. As stand age increases the final objective over many decades is to have a reverse J-shaped diameter distribution curve with a slight rise in mid-diameter tree densities. Creating this heterogeneous structure will create a more variable climate suitable for wildlife, prescribed fire, and many other factors. It is worth noting again that the size of the gap is

critical in these areas, as larger openings greater than 1 acre (and sometimes even 0.5 acre) can create issues with hardwood encroachment, lower fire intensity, and need for chemical or mechanical treatment. This can further reduce native biodiversity and set back restoration goals.

With sites that were historically wet prairie the overstory harvesting should include a clearcut to remove all overstory. Logging debris should be piled into rows and either burned or chipped. After the logging and site preparation prescribed fire operations can begin in earnest. Application of herbicide to provide better initial control of hardwoods can be applied on an as needed basis. Finally, no sites to be designated as wet prairie communities should be planted. Both herbicide application and planting guidelines are provided in the following sections.

Summary of overstory harvesting operations

- Stands will be thinned once, twice, or clearcut depending on objective, age, and basal area (Tables 4-6; Figures 8-10)
- Stands thinned to 70 or 50 ft²/ac basal area will include select (single-tree or small group) or third-row thinning with selection between rows, with no subsequent planting
- Stands thinned to 30ft²/ac residual basal area will require an operator-select (or marked by property manager or forester) thinning to leave target basal area, creating openings suitable for longleaf pine planting post-harvest
- Any longleaf pine should be retained in thinning operations (except for wet prairie restoration sites)
- Wet prairie sites should be clearcut at the first logging operation with logging debris piled into rows and burned or chipped; any bedding should be smoothed if possible (Table 7, Figure 11)
- Historical upland hardwood forest sites will not be harvested

Artificial Regeneration (Longleaf Pine Restoration Sites only) – Upon completion of thinning operations that result in an overstory basal area of 30 ft²/ac as well as the 268 acres of clearcuts in MUs 27 and 28, containerized longleaf pine seedlings should be underplanted at a loose 14' by 7' spacing, or 444 trees per acre. In some areas a higher seedling density (up to 622 trees per acre, or a 10' by 7' spacing) may be desired if groundcover is not as dense to help with fire continuity. Stands recently clearcut or those at target basal areas (~40 ft²/ac or less) should be scheduled in the next few years using the spacing guidelines mentioned above. All planting operations should be conducted during the winter. Table 8 and Figure 12 provide additional detail on planting at the stand level. This includes several stands that have been recently clearcut or are currently non-timbered. It is important to note that the 268 acres of clearcuts in MU 27 and 28 are not in the GIS and not included in Figure 12. They are however included in the activities schedule as stands 27z and 28z and in Table 8.

Some leeway can be given to the planting crews to create a less uniform arrangement of trees. In other words, it is not necessary to create perfect lines of planted seedlings, only to keep the density at about at the purchased TPA. Most planting crews are trained to plant in a straight line for future

access; however, in this case the objective is to create spatial variation. The planting crews should be specifically told that a straight line is not necessary and to look for good microsites. The use of containerized, i.e., not bare-root, longleaf pine seedlings is strongly recommended. Though slightly higher in price, containerized seedlings have a higher rate of survival than that of bare-root stock due to more planting uniformity and less planting error, quicker establishment across many sites, and higher vigor. Planting errors can occur, and the contractor may need to correct an issue provided it is included in the written contract. Some areas may need to be replanted if climatic conditions dictate, e.g., drought or flooding.

Seedlings should, if at all possible, be planted at least 5 feet away from mature pines while meeting the density objective for 2 main reasons. First, planting them some distance away from pines that will be harvested in the future better protects them from any logging damage that might occur. Second, fire intensity and proximity to a pine stem are positively related due to increased fuel loads near the base of a pine tree (Williamson and Black 1981). Though instructions such as these may increase planting costs and require more training and supervision of crews, long-term success of planting operations will be higher.

Based on current data and experience the expectation should be to pay no more than \$200/ac for planting of this type. Again, this cost is relatively high because of the use of high-quality, containerized seedlings and specific planting instructions (loose planting spacing and planting at least 5 feet from mature pines). This cost is well justified given long-term objectives.

Prescribed burning operations should be conducted no further than one growing season prior to planting of seedlings. The optimal time to burn is immediately, e.g., days, *before* planting; this allows the seedlings to establish the fastest with the least understory competition. Prescribed burns are typically conducted the winter or spring prior to planting operations.

Upon planting there should generally be a 2-3 year window at which prescribed burning is not conducted in the planted site. The rule of thumb for determination of burn survivability is that seedling root-collar diameters must be 0.2 inches or larger. This burn window can slightly vary and depends on site conditions, but based on Larson & McGowin's knowledge of the project area should not be more than 3 years. Some sites could be burned the next year, but that should be determined by the property manager and only if the seedlings are large enough in root-collar diameter (and fuel loads would support it). One must take several factors into account, including weather conditions, occurrence of drought, understory fuel loads, current and future silvicultural operations, presence of brown-spot needle blight (*Scirrhia acicola* [Dearn.] Siggers), etc. when considering a time to conduct prescribed burns.

The most successful type of a first burn post-planting is a faster-moving strip headfire. This minimizes heat that occurs around the seedling root collar and terminal bud and combust much of the understory that grows above the seedling. A backfire should never be used in the first burn operation after planting because of fire temperatures that can be lethal to a seedling. The morphology of longleaf pine seedlings provides some protection to the terminal bud as they transfer

heat above and away from the center of the stem. Usually after this first burn post-planting longleaf pine will commence height growth (another rule of thumb is when the seedlings are 1-inch in root-collar diameter), allowing the maintenance fire interval to be restored. When longleaf pines commence height growth, i.e., the “rocket stage”, they are somewhat susceptible the first year to a headfire. However, longleaf pine can survive even near total crown scorch provided the terminal buds on young seedlings are not affected. Seedling survival should be monitored for several years and augmented with additional seedlings if needed.

Natural Regeneration – As noted in the harvesting operations, preference should also be given to any longleaf pine overstory to ensure natural regeneration can take place. Natural regeneration, however, should not be expected to be successful on a large scale without frequent prescribed burns. Natural seed sources can greatly offset planting costs and help create the variation in canopy structure required for long-term restoration objectives. Typically the determination of a cone crop can be made the year before seedfall occurs by counting the cones in a mature, dominant tree. The number and vitality of cones varies among trees and sites. The USFS releases a regional cone crop survey annually which can be another source of planning for natural regeneration.

If there are candidate longleaf pine seed sources in a stand, and cone counts indicate that adequate seedfall will occur, the area should be burned in the months prior to seedfall which occurs in late October and November. In this case, some find that a growing season burn clears the site best for the bare mineral soil that is required by longleaf pine seed to germinate. As any longleaf pine in the project area should be protected from harvesting in general, consideration should also be made for opportunities of new cohorts of natural regeneration to take place. One then uses the same approach post-establishment as that of planted seedlings with respect to prescribed fire.

Summary of planting operations

- Plant containerized longleaf pine seedlings in stands with target basal area of 30 ft²/ac as well as clearcuts in MUs 27 and 28 at a loose 444 TPA (14' by 7' spacing; up to 622 TPA if needed) the next winter after the last prescribed burn (Table 8, Figure 12)
- Prescribe burn the site no later than one growing season *prior* to planting or seedfall with preference to *growing-season* burn, maximizing control of fuel sources
- Monitor seedling survival in first year
- Protect from fire for 2-3 years, then conduct a fast-moving strip headfire across the stand; once height growth begins other burn techniques (spot fire, strip headfire, backing fire) can be used to maintain fire continuity across the gap
- No planting required in areas designated as wet prairie restoration sites (Figure 7; MU 18)

Prescribed Fire – The reader is referred to the prescribed burn plan for this property. A discussion is only included to provide some context to the timber management plan. Other than the obvious objective of fuels reduction to minimize wildfire risk, prescribed burning promotes the production of many herbaceous plants and native groundcover. Burning can improve nutrient

cycling, lower the stature of hardwood components, increase flowering of understory plants, increase visibility through the area for visitors and workers, and increase the hunting experience. As the property is managed as a wildlife management area for nature-based recreation, all of these aspects are important.

Based on historical data and discussions with the property manager the project area has been burned fairly regularly for many years. *It is very strongly suggested that fire be conducted on a biennial basis in the project area with a range of 1-3 years, contingent on other objectives.* Considering the long-term restoration goals that includes establishment of natural, uneven-aged longleaf pine forests and concomitant maintenance of variation in canopy structure, prescribed burning operations should be conducted no more than 4 years apart in any given management unit. Prescribed burn schedules were not developed for this timber management plan.

In general, slightly longer burning cycles, i.e., 3-4 years, might be suitable in some areas where longleaf pine seedlings are slow in becoming established or where a relatively larger component of hardwoods may be desired. However, the manager must bear in mind that extending the fire interval 5 years or longer will likely result in the need to conduct more intensive burns, mechanical operations to sever larger hardwoods, chemical applications, or all of the above. This can set back management operations for both the longleaf pine restoration and wet prairie restoration sites. The tenet to remember is that *frequency* and not *seasonality* of prescribed burning operations is of primary importance when conducting prescribed burning on the project area. By maintaining a frequent operational burn interval of 1-4 years, with the objective of biennial burns, the land manager will have the flexibility to conduct prescribed burn operations that comport with this timber management plan.

The portions of the project area that are deemed historically wet prairie sites (MU 18) should eventually be on a 1-2 year burn cycle. These areas were historically treeless plains (due to site and frequent fire) with a tremendous amount of grasses and forbs. Prescribed fire priority should always be given to these sites if possible. It should be expected that these areas would be clearcut of their current overstory or in conjunction with a thinning, covered in the next section.

Prescribed fire should be excluded in MU 21 which is designated as a site for restoration to upland hardwood forest.

Herbicide Applications – In some cases, prescribed burning operations will not fully reduce fuel loads. This, in conjunction with dense midstory populations of waxy-leaf hardwoods, may make burning operations and accessibility difficult.

For herbicide applications the use of a backpack or skidder-type application of triclopyr is well suited for this operation. Triclopyr is a systemic foliar herbicide marketed under the trade name Garlon and many others. It is commonly used for control of waxy-leaved hardwoods such as titi, wax myrtle, baygall, etc. as well as other non-target perennials and annuals. This herbicide also has

the indirect effect of promoting several grasses and herbaceous plant species through control of target species.

The use of herbicides, in Larson & McGowin's opinion, is not needed over most of the project area. Many sites may be suitably controlled with frequent prescribed burning. However, in some stands and management units the judicious use of triclopyr or other herbicides labeled for waxy-leaf hardwoods prior to prescribed burns may greatly speed up hardwood control. Larson & McGowin forest managers have observed that a single application of triclopyr (at about \$150/acre) can lead to better control of understory hardwoods than several years of prescribed fire. The cost estimates provided in this management plan are for triclopyr only. Prices will vary depending on the type of herbicide used, labor costs, and the method of application. Any areas where management desires to retain hardwood populations should be protected from triclopyr or other herbicides labeled for hardwood control.

For sites designated as wet prairie restoration sites there may be a need for application of triclopyr or some other herbicide that controls hardwoods. Chemical applications can greatly impact native vegetation, so consideration must be made where any herbicides are deployed. The suggestion is to only use this as a last resort in the event that prescribed fire operations after a clearcut (if used at all) do not provide adequate hardwood control. As hardwoods are usually the initial and most significant seral indicator of moving away from a fire-climax community, these sites should be monitored frequently and be given any priority for herbicide (and prescribed fire) application.

Summary of herbicide operations

- Prescribe herbicide application operations judiciously using triclopyr or other herbicide labeled for hardwood and waxy-leaf plant control
- Apply herbicide with backpack or skidder-type operation
- Allow site to "brown up" prior to burning

VI. Silvicultural Recommendations

The previous section discussed the general guidelines that should be followed to meet project area management objectives. In this section specific recommendations for strata, management units, and stands are presented. Table 3 summarizes financial costs by year and silvicultural operation. Tables 4 through 8 provide stand-level detail on all silvicultural recommendations for the 15-year operational window. Figures 8 through 12 provide specific maps concerning harvesting and planting activities by year for the project area.

Recommendations by Strata

Strata 1: Longleaf Pine Restoration Objective – The approach to this stratum, which include planted and natural stands of varying ages, densities, and thinning requirements, will be to perform thinning activities to leave a set residual basal area. This stratum moves towards the

establishment of longleaf pine in the understory as a new age component to the current stand (Figure 4). This approach will be used in the vast majority of the stands. Figures 8 through 10 are maps providing detail of where thinning operations will occur in these areas, and Figure 12 shows where longleaf pine planting will occur, including any areas currently without timber.

The *gradual* movement from the current species to longleaf pine includes thinning and planting within the matrix. Plantations that can be thinned fall into 2 categories: those that can be thinned twice (to 70 or 50 ft²/ac, and then 30 ft²/ac later) and those that should be thinned once (to either 70, 50, or 30 ft²/ac). Nineteen stands in the 15-year operational window will be thinned to 70 ft²/ac residual basal area (Table 4). Fifteen stands in the 15-year operational window will be thinned to 50 ft²/ac residual basal area (Table 5). Seventy-six stands are scheduled to be thinned to a residual 30 ft²/ac of overstory basal area over the 15-year operational window (Table 6). Several of the stands to receive the heavier thinning already have a high overstory basal area. The reason these were slated for a heavier thinning is due to the harvest scheduler maximizing NPV and an attempt to create suitable sites for longleaf pine restoration quickly. As there is valid concern over fire continuity, if it is determined that too much overstory is removed the suggestion is to take an adaptive management approach to thinning stands with high overstory basal area. If the subsequent thinning of one stand results in problems with carrying prescribed fire, less timber can be removed from other stands with similar site attributes and other factors. Though this may change the value of the thinning, it will allow the manager to make the best determination of what basal area will carry prescribed fire on that particular site.

Overstory harvesting during the 70 or 50 ft²/ac thinning can be accomplished with several approaches, including selection of rows, groups of trees, or individual selection. Overstory harvesting during thinnings should try to leave openings no more than 0.3 acres in size, or approximately 2 chains (~120-130 feet) in diameter (Pecot et al. 2007, Palik et al. 2003, McGuire et al. 2001) and planting containerized longleaf pine with a 14' by 7' spacing (444 TPA; South 2006) within these gaps and scattered in the matrix. It is not recommended to make gaps greater than 0.5 acres. Based on the long-term objectives larger gaps can increase woody encroachment and actually lower survival of longleaf pine during drought periods (Pecot et al. 2007). Tables 4-6 provide stand-level detail for thinning recommendations to 70, 50, or 30 ft²/ac, respectively.

Planting in recent clearcuts, i.e., stands 27z and 28z, will occur in the first few years of the activity schedule (Table 8). Containerized longleaf pine seedlings should be planted in these stands at a density of 622 TPA (7' x 10' spacing). These can be planted in rows using a regular planting crew. Typically these stands would be allowed to grow until about age 14 when they can be first thinned using third-row thinning with operator-select between rows to about 60-70 ft²/ac. Future thinning operations would then mark candidate openings to promote natural regeneration, tracking the restoration objectives of this stratum.

Strata 2: Wet Prairie Restoration Objective – The approach to this stratum, which includes only MU 18, is to clearcut the stands in 2020 and 2025 (Table 7, Figure 11). The difference between this stratum and the longleaf pine restoration objective is two-fold. First, this stratum utilizes

clearcuts in the harvest schedule to quickly move a site to wet prairie. Second, no longleaf pine is planted in the clearcuts post-harvest. This mimics the historical definition of a wet prairie as that of a treeless plain maintained by frequent fire.

Clearcuts-especially in the context of long-term objectives of the project area-extend the time required to build adequate fuel loads and increase the probability of woody invasion. These can result in the need for herbicide operations to reduce hardwood fuel loads. For the stands slated for clearcut the recommendation is to conduct a pre-harvest prescribed burn the year prior to or year of liquidation and conduct prescribed growing-season burns annually after that.

The recommendation is to clearcut the 3 stands in MU 18 designated for wet prairie. The property manager will want to designate these new stand boundaries on the ground as harvesting operations are planned. This can be as simple as finding and marking out the boundaries so that the harvesting crew knows to remove all trees in that area. Any planting crew should be made aware of these sites so they will not be planted. It is *critically important* that fire in these areas be on no later than a 2-year interval. These sites were historically replete with a wide array of grasses and forbs. Prescribed fire priority should always be given to these sites if possible.

Strata 3: Upland Hardwood Forest Restoration Objective – The approach to this stratum, which includes only MU 21, is to refrain from prescribed burning by creating permanent firebreaks around the stands and letting these stands grow in perpetuity. Though there is a significant component of loblolly pine in the overstory, these will be gradually replaced by codominant and midstory hardwood species.

Understanding the Nexus between Silviculture and Biology

This section is intended as a primer for the reader to understand what occurs in natural longleaf pine stands when overstory gaps are created. It is a synthesis of many years of research of longleaf pine and fire ecology as well as decades of experience. This section has the goal of providing a context of how selection methods impact regeneration processes. While the discussion focuses on natural regeneration, there is a direct analogue to that of artificial regeneration that the property manager can use when planning harvests in longleaf pine stands of any age and stocking. As this is only an introduction the reader is referred to the Literature Cited section for more information.

Though longleaf pine mast seeding events can occur annually, it is well known that high seed dispersal occurs on average between 7 and 15 years. These mast seeding events, also referred to as bumper crops, are known the year before seedfall because of the 2-year cycle of cone maturity. A bumper crop is classified as a regional cone crop average of 100 cones per tree or greater. The US Forest Service has maintained a database since the late 1960s of cone counts across the natural range of longleaf pine. Interestingly, bumper crops tend to be regional in scope with local variation. This means that a bumper crop year in general results in significantly higher seed production from Virginia to Texas. This synchronization can be independent of local climate, i.e., droughts and floods. However, being an average of 10 sites across 6 states one would expect a range of values. For example, 2014 was

cited as a “very good” year for a regional cone crop with a mean of 98 cones per tree, far *above* the long-term average, with a range of 7-223. An average of 100 cones per tree or greater is considered a bumper crop. Incidentally the 2 *lowest* reported cone counts for 2014 were both in proximity to the project area³. The most recent report states that in 2015 and 2016 cone counts are expected to be *below* the long-term average, i.e., a poor crop. Thus, while the USFS report is valuable for observing long-term trends, it is suggested that monitoring of longleaf pine cone crops be performed annually in the project area for the next year’s planning of burn and planting operations. Any longleaf pine selected for cone crop monitoring should be mature (>40 years in age) occupying a dominant or codominant canopy position with a wide crown not affected by other trees. At least 3 should be selected to get a reliable average, and these *same* trees monitored annually. The FFWCC may have current staff qualified to make this determination. Fortunately, assessing potential longleaf pine cone crops is an easy skill to master provided the viewer has good eyesight, binoculars, and patience.

When it is known that the project area may have a bumper crop the next year there is adequate time to plan for a *growing-season* prescribed burn in late spring or summer prior to seedfall, which occurs around November. The objective of this prescribed burn is to create as many microsites for seedling germination as possible as longleaf pine seedlings must contact bare soil to germinate. A hot fire afforded by a growing-season burn removes much of the aboveground understory and can remove non-target pine regeneration. If there is a justifiable reason for not using growing-season fire in a stand the year of seedfall, a dormant-season prescribed burn is a viable alternative to not burning at all.

The year after seedfall will reveal a range of longleaf pine seedling densities. After a bumper crop year it is not uncommon to have seedling densities that are orders of magnitude larger than that of planted seedlings: seedling densities of 435,000/ac or more, resembling a “green carpet”, have been reported by several managers of natural longleaf pine forests after a bumper crop (*K. Larson, personal communication*). If this occurs the property manager can rest assured knowing there will be adequate regeneration. The more likely observation will be pockets of regeneration in the overstory gaps and may include slash and loblolly pine seedlings. The property manager should then begin monitoring these areas as they will be the next cohort of trees, adding age diversity to the stand.

Prescribed burning operations should not be held the following year in a burn unit or stand where natural regeneration of longleaf pine is being actively managed. A general rule is that when the root-collar diameter of naturally regenerated longleaf pine seedlings are about 0.2 inches and still in the grass stage prescribed fire can be applied again. The first prescribed fire applied can vary depending on objectives. Since the primary objective is to promote longleaf pine seedlings, a strip headfire with about 60-70 feet between strips will allow a fire to move quickly through an area and not get excessively hot. Slow-moving backfires or a single headfire are not suggested unless other stand objectives dictate it. Because these seedlings will be in the grass stage the terminal bud on the most

³ 14 cones/tree at Tall Timbers Research Station and 7 cones/tree at Apalachicola National Forest; http://www.srs.fs.usda.gov/longleaf/2014_Cone_REPORT.pdf

vigorous seedlings will be protected from lethal heat. Prescribed fire can be applied every 2-3 years thereafter.

There may be concern about excessive regeneration of loblolly and slash pine seedlings as most stands in this stratum contain significant amounts of these species. Though loblolly and slash pines can create a plethora of seedlings, they can be effectively controlled with prescribed burn operations when they are very small. Hence the prescribed burn manager may wish to target certain areas for a stronger headfire or slower backfire provided that the loss to longleaf pine regeneration will not outweigh the benefits. Loblolly and slash pine seedlings can become very difficult to control with fire alone once reaching about 5 feet in height. Using mechanical controls, i.e., mowing or logging equipment during future harvests may be one option to control these non-target species.

Natural longleaf pine seedlings will typically remain in the grass stage between 1 and 7 years after germination, with some excessively xeric sites extending the grass-stage period to 20 years. Longleaf pine regeneration usually exits the grass stage when the root-collar diameter is about the width of a thumb, or about 1 inch. The property manager should monitor the percentage of seedlings exiting the grass stage into the “rocket stage”, where substantial height growth occurs over 1-2 years. This growth pattern follows long-term flame heights from an evolutionary perspective. At the grass stage the terminal bud is *below* the highest fire temperatures, and the rocket stage allows the terminal bud to grow *above* the highest fire temperatures. Longleaf pine seedlings are most susceptible to fire damage at germination and when growing between these phenology patterns.

When longleaf pine saplings begin to differentiate in size one can begin to appreciate the impact of the overstory, the understory, and belowground competition on longleaf pine survival. The classic bell-shaped curve to longleaf pine seedlings under an overstory gap is an interaction between light and nutrient availability, root competition, and fire dynamics. This is the period where the tradeoff between survival and growth can be seen most forcefully. In essence, longleaf pine is a paradoxical species by displaying biological responses that to a land manager seem both shade-tolerant *and* shade-intolerant. Longleaf pines, like all C₃ plants, respond positively with increasing light up to a threshold. Since natural plant systems are not in a vacuum but rather in a complex assemblage of species across spatial scales one must take into account all factors acting on a regenerating seedling. To provide context, assume the following general observations between the base of a mature longleaf pine tree and the groundline extent of its crown, i.e., its dripline:

1. Fire temperature and intensity decreases
2. Available light intensity increases
3. Belowground overstory competition decreases
4. Understory and woody competition increases

These 4 parameters can account for much of the variation one sees across overstory gaps in longleaf pine forests. The intricate balance between competition (above- and belowground) and fire explain the trade-offs in longleaf pine seedling response with overstory gaps in fire-climax pine forests. Pecot et al. (2007) and Knapp et al. (2013) examined these factors in longleaf pine seedling survival

and growth under longleaf pine and loblolly pine stands, respectively. In essence, as overstory gaps increase in size longleaf pine seedlings *increase in growth* but *decrease in survival* due to the competitive interactions of light, nutrient availability, and fire. Larger overstory gaps increase light availability, but fire intensity decreases dramatically because of less prevalent pyrogenic fuel sources and more prevalent hardwoods that do not carry fire well spatially. Negligible gaps or intact canopy may *increase survival slightly* but *decrease growth substantially*. Thus, there are 3 tenets with respect to overstory basal area to consider when creating any overstory gaps (including marking a single tree for removal) for longleaf pine regeneration:

1. Overstory basal area $>60 \text{ ft}^2/\text{ac}$ results in low seedling survival and low growth, fire intensity highest
2. Overstory basal area $30\text{-}60 \text{ ft}^2/\text{ac}$ results in higher seedling survival but lower growth
3. Overstory basal area $<30 \text{ ft}^2/\text{ac}$ results in lowest seedling survival but higher growth, fire intensity lowest

This is the classic competition-facilitation paradox observed in natural longleaf pine systems maintained by prescribed fire. These patterns are seen with natural or planted longleaf pine. In our experience the most appropriate gap size when managing for FFWCC restoration objectives will be created with single-tree selection or judicious small group selection that creates a stand-level average of $30\text{-}60 \text{ ft}^2/\text{ac}$ and with gaps between $0.1\text{-}0.25$ acres. The objective of this approach is to promote longleaf pine regeneration first. Once advanced regeneration is present then consideration could be made to remove target trees to expand gaps with subsequent seed crops. However, these relic trees will serve as nests for wildlife, potential RCW cavity trees, provide a long-term fuel source, etc.

This marking and harvesting approach is not for the untrained, and it is strongly suggested that persons doing any future marking of trees for removal in these stands be sufficiently knowledgeable of longleaf pine ecosystems and AWMA in general in addition to having experience in marking timber using single-tree selection. Additionally, any harvesting crews operating heavy machinery in these stands should be clearly told to be aware of longleaf pines growing in open areas. Operators tend to cross gaps because of there are no trees to avoid. This practice must be monitored closely and discouraged. One suggestion is to flag around these areas very well and to include language in written contracts stating needs and penalties for substantial damage to longleaf pine regeneration. To fully describe the approaches used is beyond the scope of this timber management plan. The reader is urged to consult the Literature Cited section for additional resources.

Role of Adaptive Management

Any recommendations provided in this management plan are tempered with the fact that on-the-ground conditions change regularly. Fluctuations in wood markets and seasonal weather conditions are two large-scale factors that can impact operations. However, variations within the project area can alter operations at the management unit and/or stand levels. Increases in fuel loads, weather events, pests and disease, hunting, wildfires, etc. can all impact when any of the outlined silvicultural operations can commence on an individual site.

Any recommendations provided should serve as a template or guide to moving the project area towards a long-term, sustainable paradigm. Success in this goal is contingent upon being able to practice adaptive management whereby a buffering in management strategy creates a hedge against uncontrollable factors that may occur.

Though this management plan provides an activity schedule used to guide efforts across the project area, there should be an underlying tolerance to modify operations a year or two if need be. It is recommended that, in the interest of long-term timber management objectives, that prescribed fire operations be closely adhered to as much as feasible. Timber management operations are flexible with the caveat that volume and yield estimates will only be accurate for the years presented. Finally, financial assumptions presented in this management plan may change over the course of the activity window; up-to-date estimates of costs will assist the land manager and make financial planning easier. Considering all of these factors we recommend that an annual review of plan objectives be conducted and subsequent year adjustments made as necessary.

VII. Activity and Harvest Schedule

Tables 4 through 8 and Figures 8 through 12 specify the operation and year that silvicultural operations will occur in each stand.

VIII. Conclusions

The AWMA property is a unique area of Florida that has many special communities and characteristics. The long-term goal of this timber management plan is to move the project area back to communities more representative of the historical landscape. It is expected that it will take many years for the project area to resemble a fire-maintained, longleaf pine ecosystem with treeless wet prairies and historic upland hardwood forests within its matrix. Some operations will have a relatively immediate effect while others will be extremely subtle. *The expectation should not be of an immediate response of the project area to the silvicultural operations.* The restoration of structure and function, though different in their scales and impacts, will occur with the guidelines presented here. Attaining long-term objectives laid out by FFWCC will be the result of a culmination of these efforts consistently applied through time.

Using the guidelines presented in this management plan within an adaptive management paradigm gives the land manager the flexibility given variable market forces, weather conditions, and on-the-ground conditions. It is recommended that the land manager consult an expert, the literature, or both should questions arise in the future regarding cause and effect relationships brought forth by any of the silvicultural operations.

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X. List of Tables

Table 1. Summary and proportions of timber strata across the AWMA project area, including approximate acres estimated by GIS. All GIS acres are approximate.

Table 2. Summary of Timber Management Units (TMUs) for AWMA project area. *Source: request for proposal, FFWCC, March 2015.*

Table 3. Summary of income and expenses for silvicultural operations on AWMA, 2016-2030. Costs are in parentheses. All GIS acres and costs are approximate.

Table 4. Thinning operations (to 70 ft²/ac of residual overstory pine basal area) for 2016-2030, by stand for AWMA. All GIS acres are approximate.

Table 5. Thinning operations (to 50 ft²/ac of residual overstory pine basal area) for 2016-2030, by stand for AWMA. All GIS acres are approximate.

Table 6. Thinning operations (to 30 ft²/ac of residual overstory pine basal area) for 2016-2030, by stand for AWMA. All GIS acres are approximate.

Table 7. Clearcut operations for 2016-2030, by stand for AWMA. All selected stands are wet prairie restoration sites. All GIS acres are approximate.

Table 8. Longleaf pine planting activities by stand for the years 2016-2030, by stand for AWMA. All GIS acres and costs are approximate.

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- Figure 12. Map of longleaf pine planting activities on AWMA, 2016-2030, Jefferson and Taylor Counties, Florida.

Table 1. Summary and proportions of timber strata across the 14,003-acre AWMA project area, including approximate acres estimated by GIS. All GIS acres are approximate.

Cover Type	Longleaf Pine Restoration					Wet Prairie Restoration	Upland Hardwood Restoration	Total	Percent Of Project Area
	Slash Pine	Loblolly Pine	Mixed Pine	Longleaf Pine	Clearcut/Open	Slash Pine	Slash Pine		
	-----Project Area Acres-----								
Pine Plantation	12,104	1,026	94	38	0	153	207	13,622	97%
Natural Pine	0	10	92	0	0	0	0	102	1%
Open/Non-timbered	0	0	0	0	279	0	0	279	2%
TOTAL	12,104	1,036	186	38	279	153	207	14,003	100%

Table 2. Summary of Timber Management Units (TMUs) for AWMA, Jefferson and Taylor Counties, Florida. *Source: request for proposal, FFWCC, March 2015.*

Management Unit #	TMU Acreage	Timber Stand Acreage	Thinned Acres	Unthinned Acres	FFWCC Comments
1	955	387	0	387	
2	216	209	0	209	
3	3,068	1,681	1,102	579	3rd row thin and within row thinning of leave rows. Unthinned timber is under contract with active timber harvest or is scheduled to be thinned.
4	1,262	853	648	205	3rd row thin and within row thinning of leave rows. Unthinned timber is scheduled to be thinned.
5	1,347	679	414	265	3rd row thin and within row thinning of leave rows. Unthinned timber is under contract with active timber harvest. Includes 32 acres clearcut planted w/LL pine.
6	418	233	233	0	3rd row thin and within row thinning of leave rows.
7	1,011	491	491	0	3rd row thin and within row thinning of leave rows.
8	761	307	0	307	
9	77	36	36	0	3rd row thin and within row thinning of leave rows. Historic wet prairie.
10	1,045	574	566	8	3rd row thin and within row thinning of leave rows.
11	562	139	139	0	3rd row thin and within row thinning of leave rows.
12	1,214	624	436	188	3rd row thin and within row thinning of leave rows. Unthinned timber is scheduled to be thinned.
13	1,246	518	0	518	
14	727	370	0	370	223 acres of MU scheduled to be thinned.
15	598	367	10	357	272 acres of MU scheduled to be thinned. Includes 23 acres of non-timbered areas from wildfire.
16	74	69	15	54	3rd row thin and within row thinning of leave rows. Unthinned timber is scheduled to be thinned.
17	375	256	194	62	3rd row thin and within row thinning of leave rows. Unthinned timber is under contract with active timber harvest.
18	228	153	121	32	3rd row thin and within row thinning of leave rows. Historic wet prairie.
19	1,558	839	416	423	3rd row thin and within row thinning of leave rows. Some thinning was completed after forest inventory.
20	477	349	177	172	3rd row thin and within row thinning of leave rows. Some thinning was completed after forest inventory.
21	1,327	207	0	207	Historic upland hardwood forest.

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Management Unit #	TMU Acreage	Timber Stand Acreage	Thinned Acres	Unthinned Acres	FFWCC Comments
22	432	359	0	359	
24	782	406	0	406	Unthinned timber is scheduled to be thinned.
25	1,577	801	801	0	3rd row thin and within row thinning of leave rows.
26	15,113	203	0	203	81 acres of MU is scheduled to be sold.
27	1,394	585	0	443	142 acres of clear cut areas.
28	2,277	1,139	313	700	3rd row thin and within row thinning of leave rows. Includes 126 acres of clear cut areas. Unthinned timber scheduled to be thinned.
29	677	484	484	0	3rd row thin and within row thinning of leave rows.
31	402	77	77	0	3rd row thin and within row thinning of leave rows.
32	389	101	101	0	3rd row thin and within row thinning of leave rows.
33	293	113	111	2	3rd row thin and within row thinning of leave rows.
34	1,191	235	143	92	3rd row thin and within row thinning of leave rows. Unthinned acres are natural stands.
35	128	49	0	49	
36	411	110	0	110	
Total	43,612	14,003	7,028	6,707	268 acres of clear cuts

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Table 3. Summary of income and expenses for silvicultural operations on AWMA, 2016-2030. Costs are in parentheses. All GIS acres and costs are approximate.

Year	Thinning (to 70/50/30 ft ² /ac)		Clearcut		Planting		Total Revenue	Total Cost	Net Revenue
	Acres	Income (\$)	Acres	Income (\$)	Acres	Cost (\$)	\$	\$	\$
2016	943	\$720,930	0	\$0	1,704	\$(340,736)	\$720,390	\$(340,736)	\$379,654
2017	483	\$386,744	0	\$0		\$0	\$386,774	\$-	\$386,774
2018	1,078	\$469,298	0	\$0	361	\$(72,277)	\$469,298	\$(72,277)	\$397,021
2019	1,116	\$872,017	0	\$0	255	\$(51,000)	\$872,017	\$(51,000)	\$821,017
2020	1,095	\$1,223,624	121	\$110,461	685	\$(136,926)	\$1,334,086	\$(136,926)	\$1,197,159
2021	1,046	\$1,159,013	0	\$0	307	\$(61,478)	\$1,159,013	\$(61,478)	\$1,097,535
2022	1,239	\$1,222,574	0	\$0	666	\$(133,158)	\$1,222,574	\$(133,158)	\$1,089,416
2023	691	\$783,786	0	\$0	675	\$(135,069)	\$783,786	\$(135,069)	\$648,717
2024	481	\$478,063	0	\$0	299	\$(59,806)	\$478,063	\$(59,806)	\$418,257
2025	833	\$556,362	32	\$92,575	417	\$(83,400)	\$648,938	\$(83,400)	\$565,538
2026	699	\$640,672	0	\$0	673	\$(134,534)	\$640,672	\$(134,534)	\$506,138
2027	721	\$1,030,796	0	\$0	537	\$(107,345)	\$1,030,796	\$(107,345)	\$923,450
2028	634	\$741,039	0	\$0	282	\$(56,348)	\$741,039	\$(56,348)	\$684,691
2029	464	\$647,876	0	\$0	570	\$(114,024)	\$647,876	\$(114,024)	\$533,852
2030	480	\$682,273	0	\$0	699	\$(139,849)	\$682,273	\$(139,849)	\$542,424
Total	12,004	\$11,614,556	153	\$203,037	8,130	\$(1,625,950)	\$11,817,592	\$(1,625,950)	\$10,191,643

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Table 4. Thinning operations (to 70 ft²/ac of residual overstory pine basal area) for 2016-2030, by stand for AWMA. All GIS acres are approximate.

Year	Stand	Acres
2016	14a	33
2017	24	103
2018	14	120
2018	15d	62
2018	2	207
2019	24b	178
2020	12b	93
2020	4e	109
2021	14b	94
2021	19c	159
2021	36	110
2022	13a	117
2022	20b	128
2023	20a	58
2024	19a	150
2024	35	49
2025	1	222
2025	10b	9
2030	19b	117
TOTAL		2,120

Table 5. Thinning operations (to 50 ft²/ac of residual overstory pine basal area) for 2016-2030, by stand for AWMA. All GIS acres are approximate.

Year	Stand	Acres
2016	26d	10
2016	28b	281
2016	28c	277
2017	4d	72
2018	4c	24
2019	24a	124
2019	3h	138
2020	12	92
2020	13b	203
2020	27	177
2021	27a	85
2021	27b	181
2022	13	197
2022	14c	124
2023	12a	96
TOTAL		2,083

Table 6. Thinning operations (to 30 ft²/ac of residual overstory pine basal area) for 2016-2030, by stand for AWMA. All GIS acres are approximate.

Year	Stand	Acres
2016	12c	342
2017	8	307
2018	19f	83
2018	28e	53
2018	29e	35
2018	2a	14
2018	3c	87
2018	5a	38
2018	5d	135
2018	5g	51
2018	5h	135
2018	9	36
2019	16b	26
2019	22a	17
2019	26a	47
2019	29b	153
2019	34b	92
2019	3e	138
2019	7	202
2020	10	249
2020	18	36
2020	18a	85
2020	29d	50
2021	29	172
2021	3	207
2021	5f	37
2022	15	106
2022	15a	10
2022	15c	114
2022	28a	105
2022	29a	48
2022	7a	290
2023	10a	316
2023	16a	28
2023	19	193
2024	3f	49
2024	6	233
2025	11	139
2025	14a	33
2025	18b	32
2025	33a	105
2025	3b	247
2025	3k	46
2026	15b	52
2026	17	63
2026	17a	85
2026	17b	109
2026	19g	43
2026	24	103

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Year	Stand	Acres
2026	26b	113
2026	31	77
2026	33b	8
2026	5	36
2026	5i	10
2027	14	120
2027	15d	62
2027	16	15
2027	2	207
2027	20c	75
2027	26	12
2027	26c	22
2027	28	35
2027	29c	27
2027	34d	37
2027	5e	109
2028	20d	5
2028	24b	178
2028	4	451
2029	12b	93
2029	28d	262
2029	4e	109
2030	14b	94
2030	19c	159
2030	36	110
TOTAL		7,801

Table 7. Clearcut operations for 2016-2030, by stand for AWMA. All selected stands are wet prairie restoration sites. All GIS acres are approximate.

Year	Stand	Acres
2020	18	36
2020	18a	85
2025	18b	32
TOTAL		153

Table 8. Longleaf pine planting activities by stand for the years 2016-2030, by stand for AWMA. All GIS acres and costs are approximate.

Year	Stand	Acres	Cost (\$)
2016	19d	42	\$ 8,479
2016	19e	52	\$ 10,315
2016	20	82	\$ 16,329
2016	25	253	\$ 50,688
2016	25a	236	\$ 47,202
2016	25b	135	\$ 26,957
2016	25c	70	\$ 13,905
2016	25d	108	\$ 21,546
2016	26d	10	\$ 1,901
2016	32	101	\$ 20,131
2016	34a	54	\$ 10,703
2016	3d	108	\$ 21,576
2016	3g	349	\$ 69,772
2016	3j	96	\$ 19,122
2016	5c	11	\$ 2,111
2018	4a	171	\$ 34,277
2018	4b	25	\$ 5,000
2018	27z	142	\$ 28,400
2018	15z	23	\$ 4,600
2019	5b	77	\$ 15,400
2019	28z	126	\$ 25,200
2019	34c	52	\$ 10,400
2020	12c	342	\$ 68,450
2020	22	342	\$ 68,476
2021	8	307	\$ 61,478
2022	19f	83	\$ 16,506
2022	28e	53	\$ 10,538
2022	29e	35	\$ 6,911
2022	2a	14	\$ 2,892
2022	3c	87	\$ 17,445
2022	5a	38	\$ 7,549
2022	5d	135	\$ 27,017
2022	5g	51	\$ 10,123
2022	5h	135	\$ 26,957
2022	9	36	\$ 7,218
2023	16b	26	\$ 5,240
2023	22a	17	\$ 3,380
2023	26a	47	\$ 9,432
2023	29b	153	\$ 30,575
2023	34b	92	\$ 18,452
2023	3e	138	\$ 27,665
2023	7	202	\$ 40,325
2024	10	249	\$ 49,888
2024	29d	50	\$ 9,918
2025	29	172	\$ 34,485
2025	3	207	\$ 41,439
2025	5f	37	\$ 7,475
2026	15	106	\$ 21,182
2026	15a	10	\$ 2,028

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Year	Stand	Acres	Cost (\$)
2026	15c	114	\$ 22,732
2026	28a	105	\$ 21,091
2026	29a	48	\$ 9,538
2026	7a	290	\$ 57,963
2027	10a	316	\$ 63,139
2027	16a	28	\$ 5,565
2027	19	193	\$ 38,642
2028	3f	49	\$ 9,804
2028	6	233	\$ 46,544
2029	11	139	\$ 27,849
2029	14a	33	\$ 6,581
2029	33a	105	\$ 20,962
2029	3b	247	\$ 49,490
2029	3k	46	\$ 9,142
2030	15b	52	\$ 10,476
2030	17	63	\$ 12,531
2030	17a	85	\$ 17,032
2030	17b	109	\$ 21,707
2030	19g	43	\$ 8,613
2030	24	103	\$ 20,695
2030	26b	113	\$ 22,588
2030	31	77	\$ 15,301
2030	33b	8	\$ 1,650
2030	5	36	\$ 7,294
2030	5i	10	\$ 1,961
TOTAL		8,130	

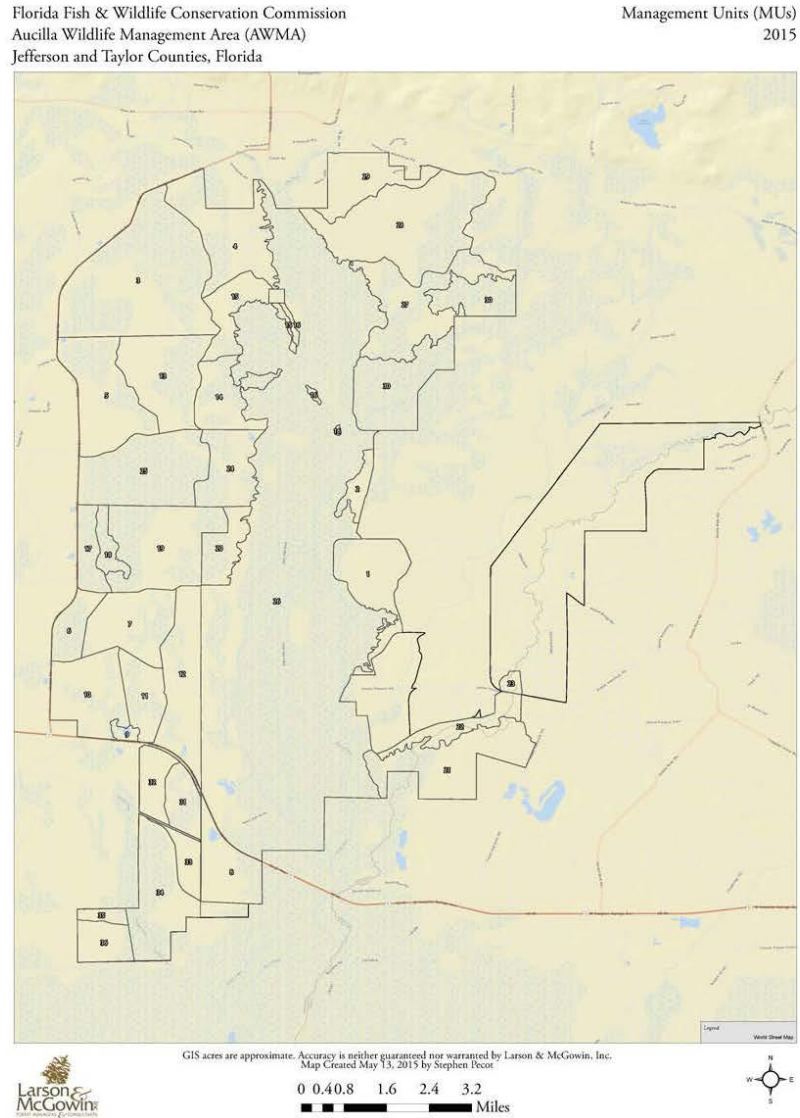


Figure 1. Map of AWMA Management Units (MUs) as part of the 2016-2030 management plan, Jefferson and Taylor Counties, Florida.

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Current Cover Type
2015

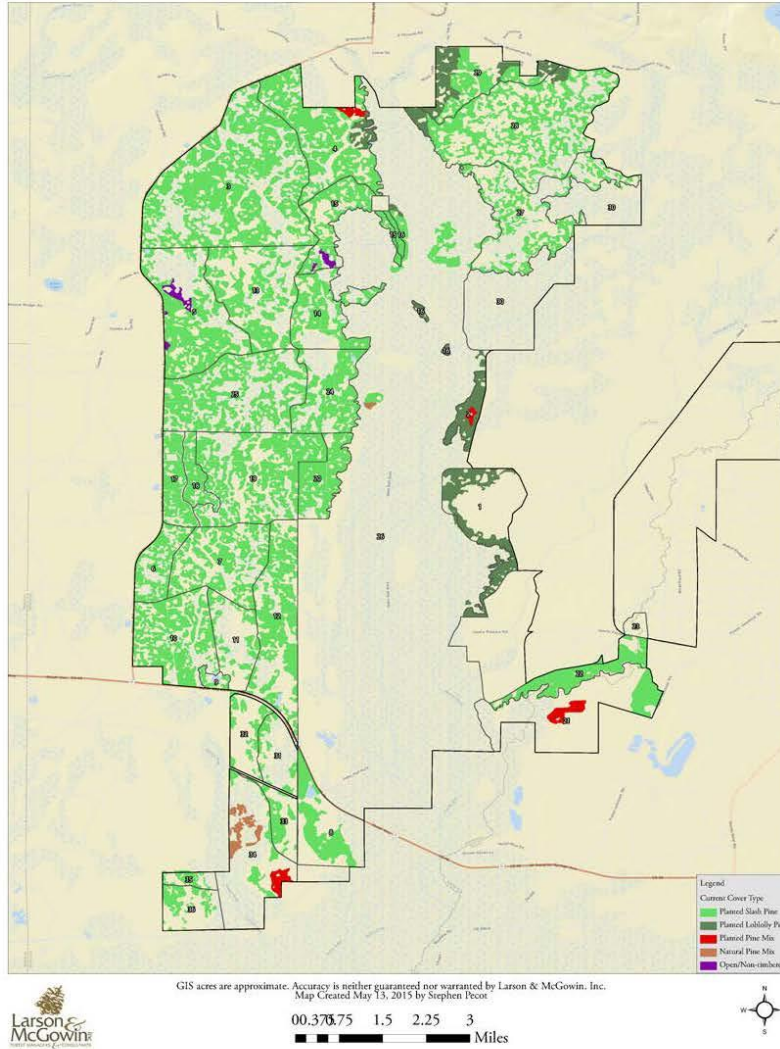


Figure 2. Map of current timber cover types of AWMA as of 2015, Jefferson and Taylor Counties, Florida.

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Current Timber Stand Conditions (Age)
2015

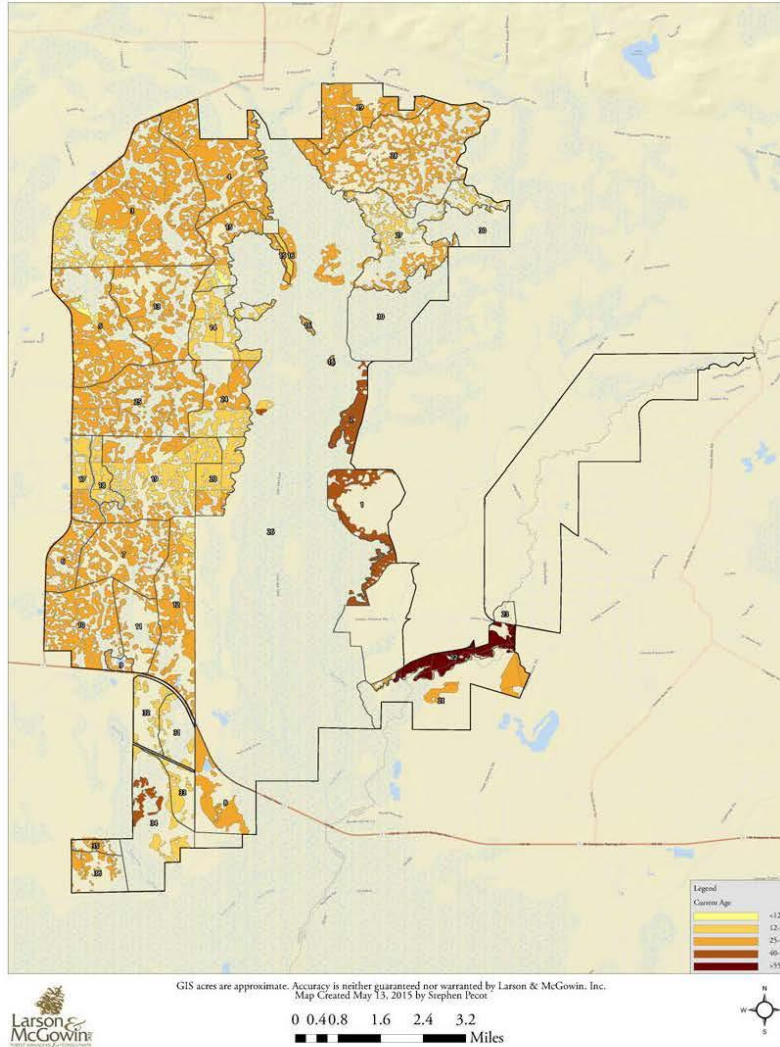


Figure 3. Map of current stand ages of AWMA as of 2015, Jefferson and Taylor Counties, Florida.

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Current Timber Stand Conditions (Trees per acre)
2015

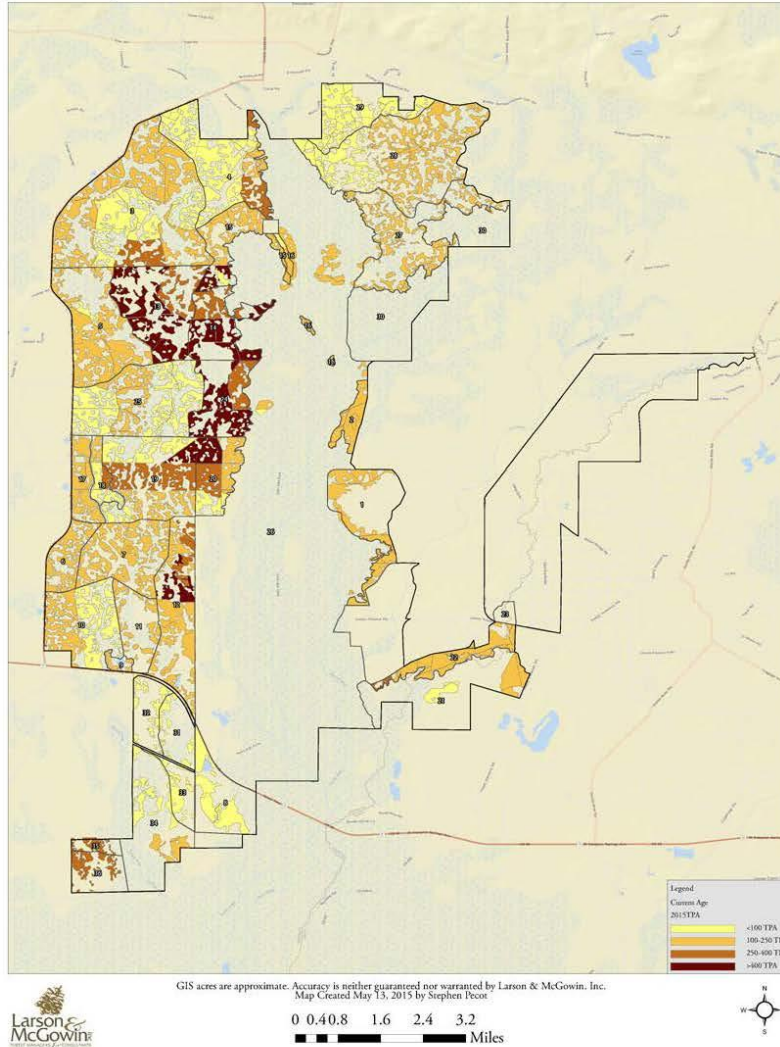


Figure 4. Map of current trees per acre of AWMA as of 2015, Jefferson and Taylor Counties, Florida.

Florida Fish & Wildlife Conservation Commission Current Timber Stand Conditions (Basal Area in sq.ft. per acre)
 Aucilla Wildlife Management Area (AWMA) 2015
 Jefferson and Taylor Counties, Florida

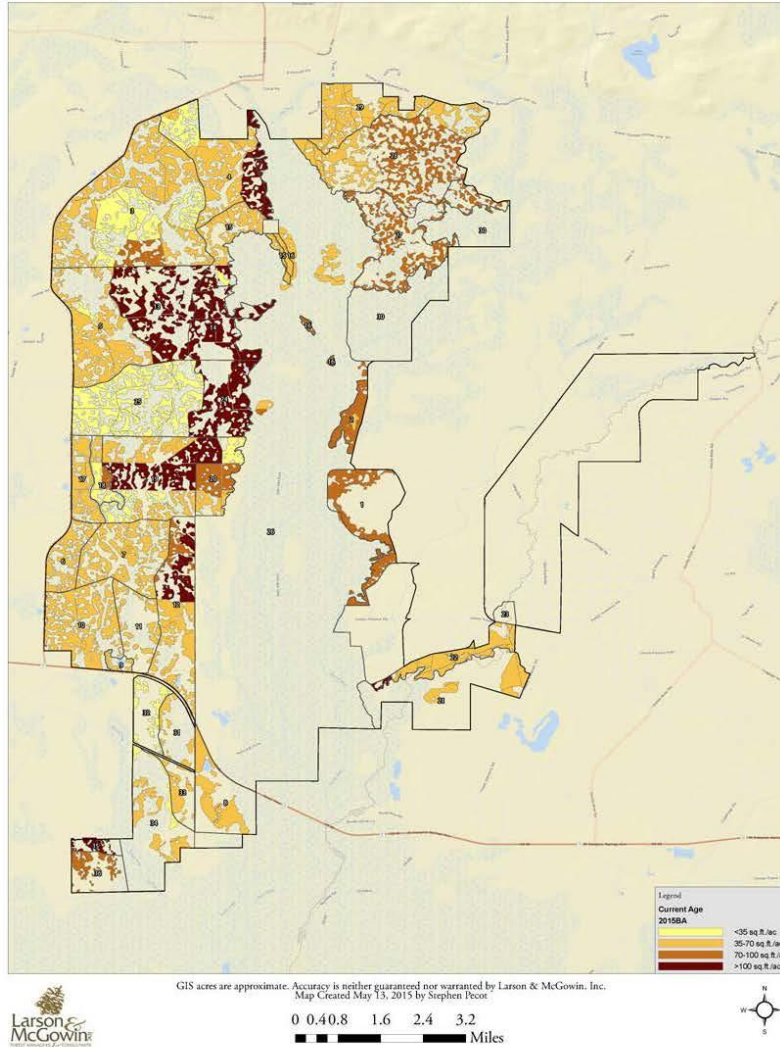


Figure 5. Map of current basal area (ft²/ac) of AWMA as of 2015, Jefferson and Taylor Counties, Florida.

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Current Communities (source: FNAI)
2015

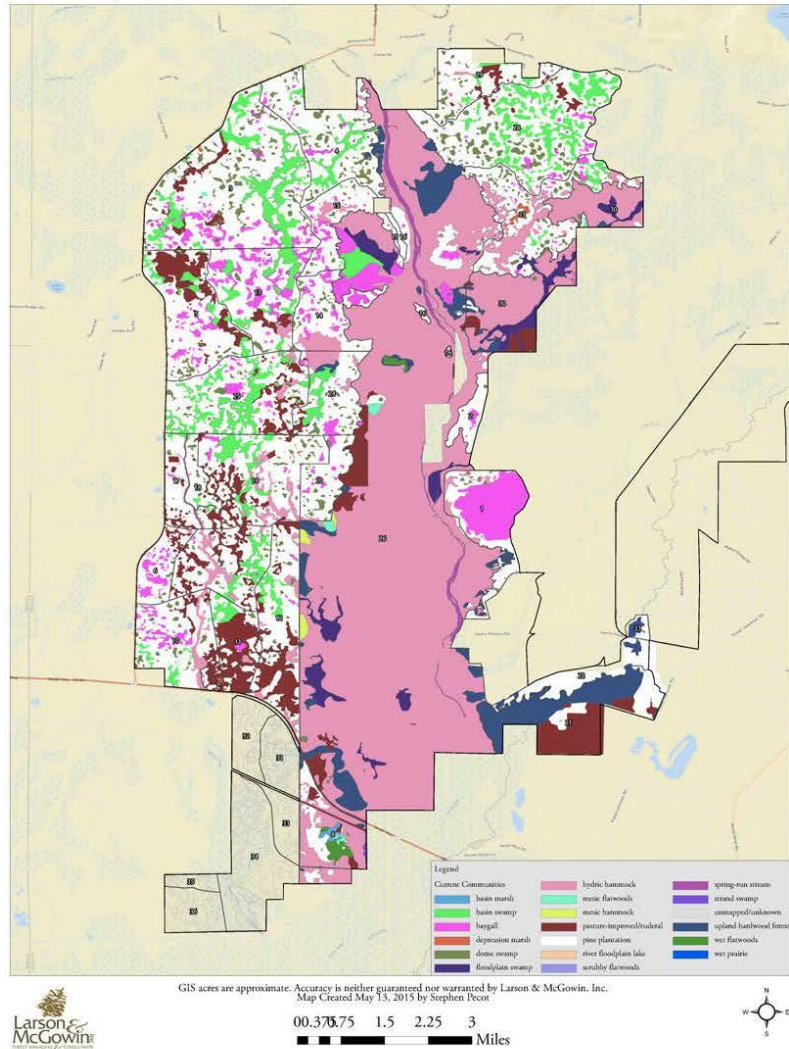


Figure 6. Map of current communities on timber stands of AWMA, Jefferson and Taylor Counties, Florida.

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Historic Natural Communities (source: FNAI)
2015

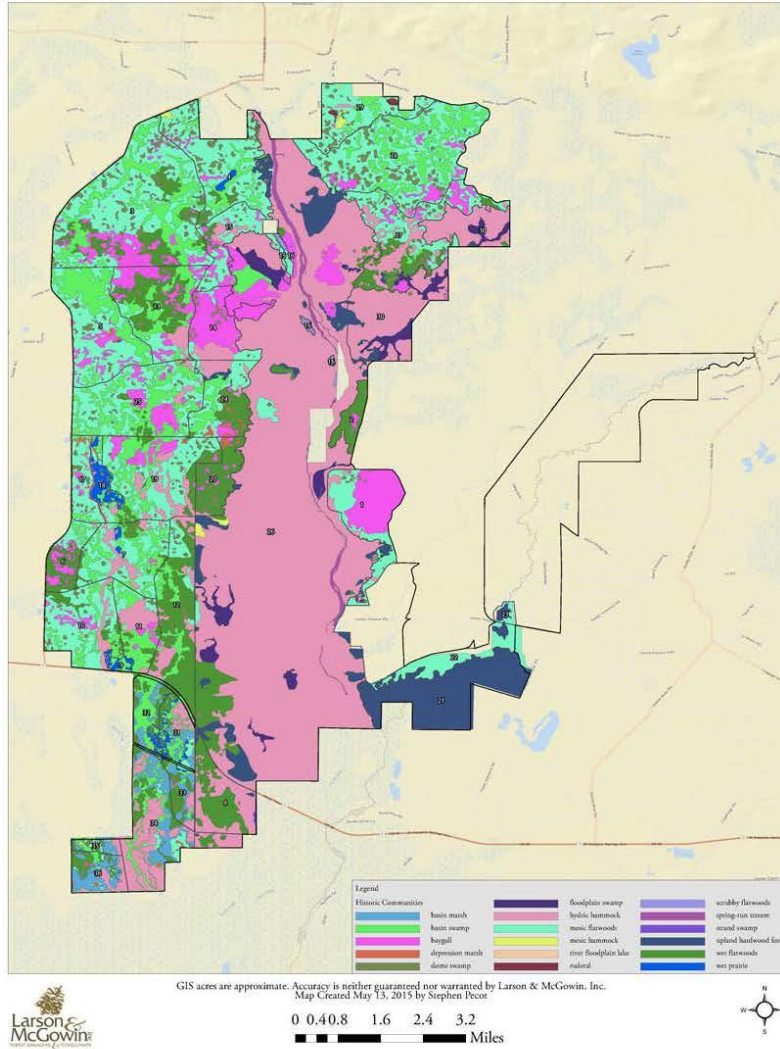


Figure 7. Map of objective historical communities on timber stands of AWMA, Jefferson and Taylor Counties, Florida.

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Prescribed Thinning (to 70 sq.ft./ac)
2016-2030

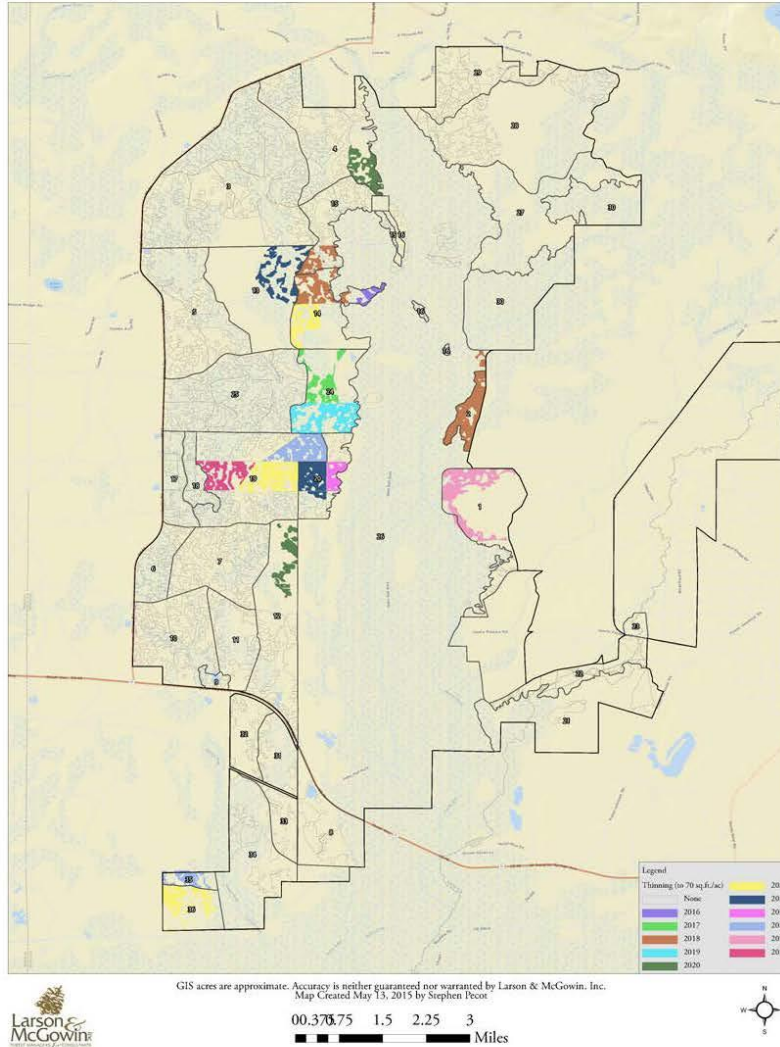


Figure 8. Map of thinning activities (to 70 ft²/ac of residual overstory basal area) on AWMA, 2016-2030, Jefferson and Taylor Counties, Florida.

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Prescribed Thinning (to 50 sq.ft./ac)
2016-2030

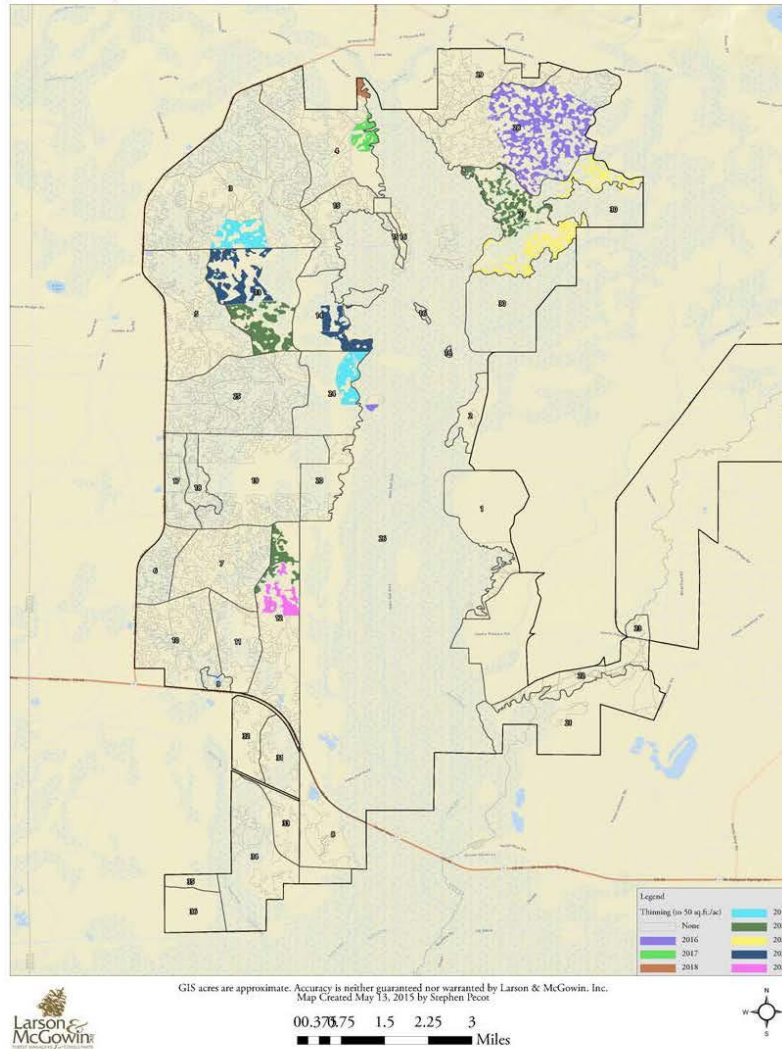


Figure 9. Map of thinning activities (to 50 ft²/ac of residual overstory basal area) on AWMA, 2016-2030, Jefferson and Taylor Counties, Florida.

Aucilla Wildlife Management Area (AWMA) Timber Management Plan, 2016-2030

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Prescribed Thinning (to 30 sq.ft./ac)
2016-2030

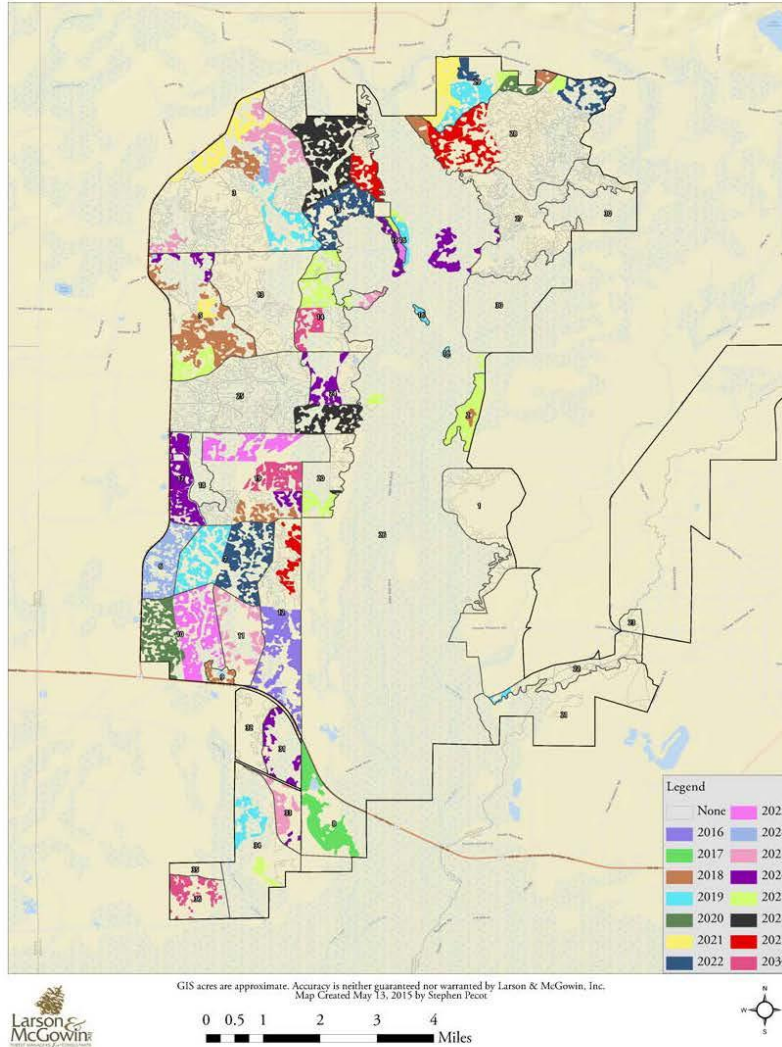


Figure 10. Map of thinning activities (to 30 ft²/ac of residual overstory basal area) on AWMA, 2016-2030, Jefferson and Taylor Counties, Florida.

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Prescribed Clearcuts
2016-2030

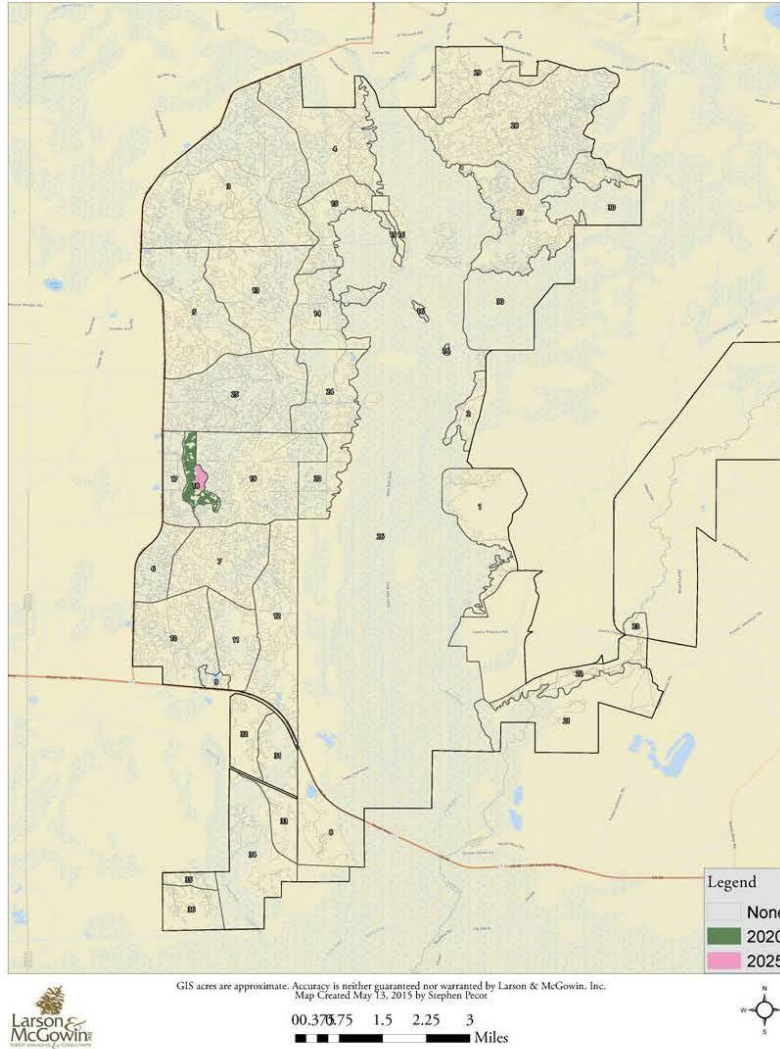


Figure 11. Map of clearcut activities on AWMA, 2016-2030, Jefferson and Taylor Counties, Florida.

Florida Fish & Wildlife Conservation Commission
Aucilla Wildlife Management Area (AWMA)
Jefferson and Taylor Counties, Florida

Prescribed Longleaf Pine Planting
2016-2030

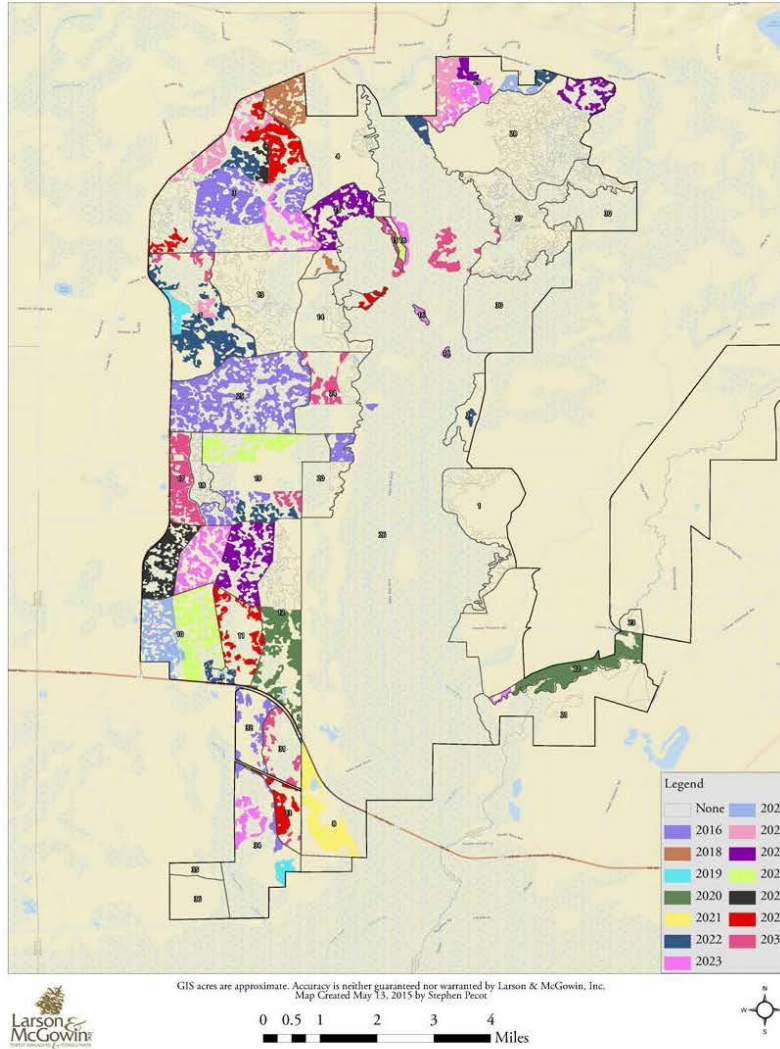


Figure 12. Map of longleaf pine planting activities on AWMA, 2016-2030, Jefferson and Taylor Counties, Florida.

11.18 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

11.19 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.

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 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.
 - 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.
- 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

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Date: _____

Mike Brooks, Section Leader
Terrestrial Habitat Conservation and
Restoration

Witness

Date: _____

Witness

Approved as to form and legality

Commission Attorney

Date: _____

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.

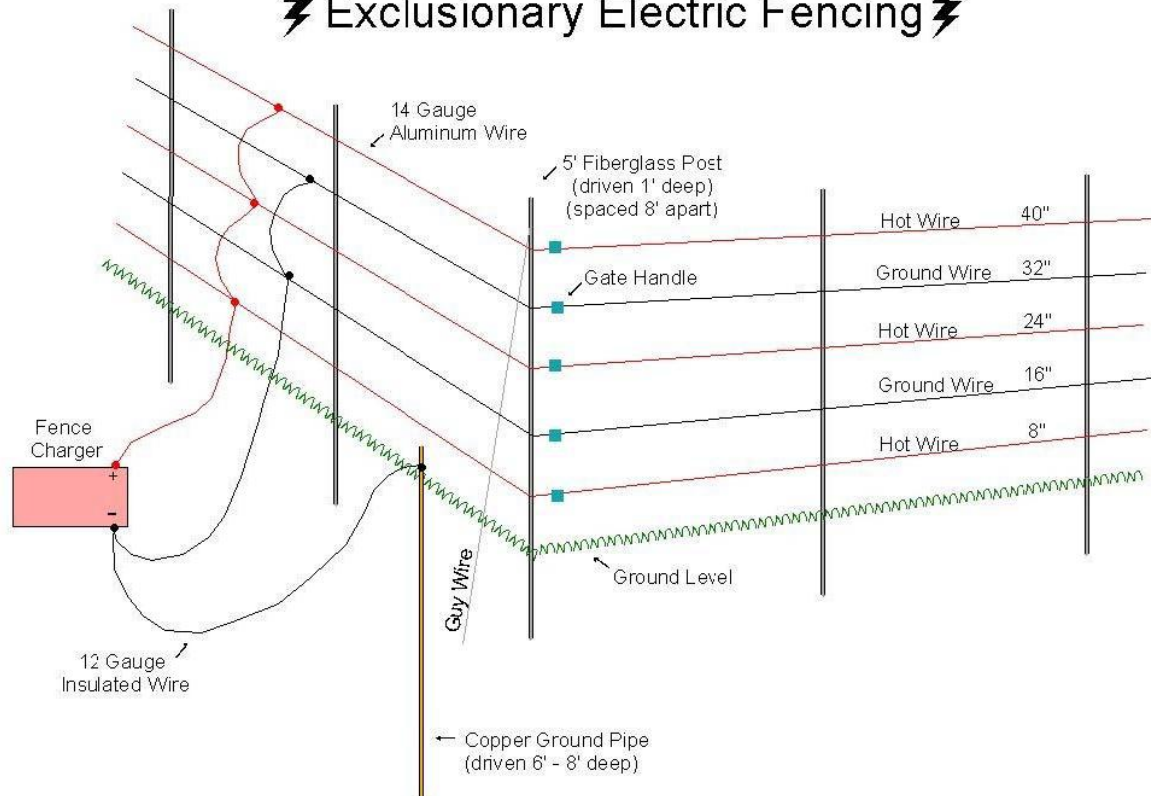
Tips to improve the effectiveness of your electric fence to deter black bears:

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.

⚡ Exclusionary Electric Fencing ⚡



AGREEMENT
ATTACHMENT 2

Place Holder for Map
Of
Apiary Locations
At
WMA/WEA

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.

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.

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.

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.
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.

11.20 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

11.21 Operation Plan Fiscal Year 2026-2027

Activity	Description	Man Days	Salary	Fuel Cost	Other	Total
128	New Vehicle and Equipment Purchases	7	\$1,677.76	\$138.88	\$10,500.00	\$12,316.64
150	Personnel management	80	\$19,174.40	\$1,587.20	\$1,500.00	\$22,261.60
201	Cultural resource management	30	\$7,190.40	\$595.20	\$200.00	\$7,985.60
202	Timber management	15	\$3,595.20	\$297.60	\$0.00	\$3,892.80
204	Resource planning	210	\$50,332.80	\$4,166.40	\$4,750.00	\$59,249.20
205	Burning	170	\$40,745.60	\$3,372.80	\$70,000.00	\$114,118.40
208	Firebreaks	20	\$4,793.60	\$396.80	\$0.00	\$5,190.40
212	Exotic plant control (chemical)	35	\$8,388.80	\$694.40	\$1,000.00	\$10,083.20
221	Animal surveys	20	\$4,793.60	\$396.80	\$27,632.00	\$32,822.40
235	Vegetation and plant surveys	20	\$4,793.60	\$396.80	\$500.00	\$5,690.40
289	Native vegetation management (mechanical)	55	\$13,182.40	\$1,091.20	\$22,000.00	\$36,273.60
290	Native vegetation management (chemical)	15	\$3,595.20	\$297.60	\$70,000.00	\$73,892.80
295	Biological data collection, analysis, and reporting	10	\$2,396.80	\$198.40	\$0.00	\$2,595.20
312	Informational signs	15	\$3,595.20	\$297.60	\$750.00	\$4,642.80
341	Public use administration (hunting)	15	\$3,595.20	\$297.60	\$200.00	\$4,092.80
342	Public use administration (non-hunting)	10	\$2,396.80	\$198.40	\$0.00	\$2,595.20
920	FEM -- buildings/structures	38	\$9,107.84	\$753.92	\$33,000.00	\$42,861.76
923	FEM -- vehicles/equipment	140	\$33,555.20	\$2,777.60	\$62,300.00	\$98,632.80
926	FEM -- roads/bridges	90	\$21,571.20	\$1,785.60	\$200,000.00	\$223,356.80
928	FEM -- fences	5	\$1,198.40	\$99.20	\$3,000.00	\$4,297.60
Total:		1,000.00	\$239,680.00	\$19,840.00	\$507,332.00	\$766,852.00

11.22 Arthropod Control Plans

11.22.1 Jefferson County Arthropod Control Plan



WILTON SIMPSON
COMMISSIONER

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

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: Aucilla Wildlife Management Area

Is Control Work Necessary: ☐ Yes ☒ No

Location: Jefferson County, east of SR 59, south of Wacissa to St. Marks National Wildlife Refuge.

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:

FDACS-13668 Rev. 05/15 Page 2 of 4

Arthropod Species for Which Control is Proposed: _____

Proposed Larval Control: _____

Proposed larval monitoring procedure: _____

Are post treatment counts being obtained: ☐ Yes ☐ No

Biological Control of Larvae: _____

Might predacious fish be stocked: ☐ Yes ☒ No

Other biological controls that might be used: _____

Material to be Used for Larvaciding Applications:

(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: _____

☐ Ground

☐ Aerial

Rate of application: _____

Method of application: _____

Proposed Adult Mosquito Control:

Aerial adulticiding ☐ Yes ☒ No

Ground adulticiding ☐ Yes ☒ No

Please specify the following for each adulticide:

Chemical or common name: _____

Rate of application: _____

Method of application: _____

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: 1484 S. JEFFERSON HWY MONTICELLO, FL 32344

How long are records maintained: RECORDS ARE MAINTAINED PER. FL STATUTE

Vegetation Modification:

What trimming or altering of vegetation to conduct surveillance or treatment is proposed? _____

Proposed Land Modifications:

Is any land modification, i.e., rotary ditching, proposed: _____

Include proposed operational schedules for water fluctuations: _____

List any periodic restrictions, as applicable, for example peak fish spawning times.

Proposed Modification of Aquatic Vegetation: _____

Land Manager Comments: _____

Arthropod Control Agency Comments: _____

James C Conner III

12/23/2025

Signature of Lands Manager or Representative

Date

Daniel W. H. H.

12/23/25

Signature of Mosquito Control Director / Manager

Date

11.22.2 Taylor County Arthropod Control Plan



Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

WILTON SIMPSON
COMMISSIONER

Section 388.4111, F.S.
Telephone: (850) 617-7995

Return to:
Mosquito Control Program
3125 Conner Blvd., Bldg. 6,
Tallahassee, FL 32399-1650

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: Aucilla Wildlife Management Area

Is Control Work Necessary: ☐ Yes ☒ No

Location: Southern Jefferson County and western Taylor County.

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

Arthropod Species for Which Control is Proposed: _____

Proposed Larval Control: _____

Proposed larval monitoring procedure: _____

Are post treatment counts being obtained: ☐ Yes ☒ No

Biological Control of Larvae: _____

Might predacious fish be stocked: ☐ Yes ☒ No

Other biological controls that might be used: _____

Material to be Used for Larvaciding Applications:

(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: _____

☐ Ground

☐ Aerial

Rate of application: _____

Method of application: _____

Proposed Adult Mosquito Control:

Aerial adulticiding ☐ Yes ☒ No

Ground adulticiding ☐ Yes ☒ No

Please specify the following for each adulticide:

Chemical or common name: _____

Rate of application: _____

Method of application: _____

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: _____

How long are records maintained: _____

Vegetation Modification:

What trimming or altering of vegetation to conduct surveillance or treatment is proposed? None _____

Proposed Land Modifications:

Is any land modification, i.e., rotary ditching, proposed: None _____

Include proposed operational schedules for water fluctuations: None _____

List any periodic restrictions, as applicable, for example peak fish spawning times.

None _____

Proposed Modification of Aquatic Vegetation: None _____

Land Manager Comments: _____

Arthropod Control Agency Comments: _____

James C Conner III

12/30/2025

Signature of Lands Manager or Representative Date

Bail Hilson 12/30/2025
Mosquito Control Director

Signature of Mosquito Control Director / Manager Date

Taylor County, Florida 32348

11.23 County Letters of Compliance with Local Government Comprehensive Plans

11.23.1 Jefferson County Compliance Letter

JEFFERSON COUNTY
PLANNING DEPARTMENT
445 W. PALMER MILL ROAD - MONTICELLO, FL 32345
Phone (850) 342-0223



June 1st 2026

Cedar Spirk
Land Conservation Planner IV
Division of Habitat and Species Conservation
Florida Fish and Wildlife Conservation Commission

RE: Review of Aucilla WMA 2026-2036 Management Plan

On behalf of the Jefferson County Planning Department, I am pleased to provide a review of the Florida Fish and Wildlife Conservation Commission's Aucilla Wildlife Management Area Ten Year Management Plan. Planning Department staff has reviewed the Management Plan and find the Plan is compliant with the County's Comprehensive Plan.

Thank you,

David C. Wheeler
Jefferson County Planning Official

11.23.2 Taylor County Compliance Letter

JAMIE ENGLISH
District 1

JIM MOODY
District 2

MICHAEL NEWMAN
District 3

PAM FEAGLE
District 4

THOMAS DEMPS
District 5



TAYLOR COUNTY BOARD OF COUNTY COMMISSIONERS *BUILDING / PLANNING DEPARTMENT*

GARY KNOWLES, Clerk
Post Office Box 620
Perry, Florida 32348
(850) 838-3506 - Phone
(850) 838-3549 - Fax

LAWANDA PEMBERTON, County Administrator
201 East Green Street
Perry, Florida 32347
(850) 838-3500, ext. 7 - Phone
(850) 838-3501 - Fax

CONRAD C. BISHOP, JR., County Attorney
Post Office Box 167
Perry, Florida 32348
(850) 584-6113 - Phone
(850) 584-2433 - Fax

May 20, 2026

Cedar Spirk, Land Conservation Planner
Florida Fish and Wildlife Conservation Commission
620 S. Meridian Street
Tallahassee, FL 32399

RE: Review of Draft copy of Aucilla Wildlife Management Area Ten-Year Land Management Plan (2026-2036)

Dear Cedar,

Thank you for Providing Taylor County staff with the opportunity to review the draft of the Florida Fish and Wildlife Conservation Commission's Ten-Year Land Management Plan (2026-2036) for Aucilla Wildlife Management Area. The draft plan is very thorough and well-written and is in compliance with the goals, objectives and policies of the Taylor County Comprehensive Plan.

Should you need anything further, feel free to contact me anytime,

Respectfully,

A blue ink signature of Terrance McKee, consisting of a stylized 'T' and 'M'.

Terrance McKee
Taylor County Building Official