

A Management Plan for
Apalachee
Wildlife Management Area
2015 - 2025



Jackson County, Florida

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



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

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Governor

Carlos Lopez-Cantera
Lt. Governor

Jonathan P. Steverson
Secretary

September 1, 2015

Mr. Gary Cochran
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600

RE: Apalachee Wildlife Management Area

Dear Mr. Cochran:

On **August 21, 2015**, the Acquisition and Restoration Council recommended approval of the **Apalachee Wildlife Management Area** management plan. Therefore, the Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the Apalachee Wildlife Management Area management plan. The next management plan update is due August 21, 2025.

Approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

A handwritten signature in cursive script that reads "M. S. Gengenbach".

Marianne S. Gengenbach
Office of Environmental Services
Division of State Lands

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**A Management Plan
for
Apalachee Wildlife Management Area**

Jackson County, Florida

Owned by the United States Army Corps of Engineers
Managed by the Florida Fish and Wildlife Conservation Commission



June 2015

Approved Thomas H. Eason

Thomas Eason
Director, Division of Habitat and Species Conservation

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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

Lead Agency: Florida Fish and Wildlife Conservation Commission (FWC)

Common Name of Property: Apalachee Wildlife Management Area

Location: Jackson County, Florida

Acreage Total: 7,952 acres

Acreage Breakdown:

<u>Land Cover Classification</u>	<u>Acres</u>	<u>Percent of Total Area</u>
Agriculture	700.6	8.9%
Artificial pond	2.8	<0.1%
Basin marsh	94.0	1.2%
Basin swamp	52.1	0.7%
Bottomland forest	1,249.1	15.9%
Canal/ditch	11.4	0.1%
Clastic upland lake	282.5	3.6%
Clearcut pine plantation	7.3	0.1%
Clearing/regeneration	8.4	0.1%
Depression marsh	13.0	0.2%
Developed	7.3	0.1%
Dome swamp	5.7	0.1%
Floodplain marsh	268.8	3.4%
Floodplain swamp	413.3	5.3%
Impoundment	859.6	10.9%
Pine plantation	12.6	0.2%
Road	63.5	0.8%
Sandhill	326.5	4.1%
Sandhill upland lake	38.4	0.5%
Spoil area	1.2	<0.1%
Successional hardwood forest	113.0	1.4%
Upland hardwood forest	1,074.5	13.7%
Upland mixed woodland	519.3	6.6%
Upland pine	1,743.9	22.2%

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

Lease/Management Agreement No.: License Number DACW01-3-05-0028 (Appendix 13.1)

Use: Single

Multiple X

Management Responsibilities:

Agency FWC

Responsibilities

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

Designated Land Use: Wildlife Management Area

Sublease (s): None

Encumbrances: List: Agricultural leases, staff residence, and Jackson County drainage ditch easement

Type Acquisition: Federally owned land (ACOE)

Unique Features: Natural: Representative natural communities include upland pine, bottomland forest, upland hardwood forest, upland mixed woodland, floodplain swamp, and sandhill. Other unique features include the area's location along the Chattahoochee River and Lake Seminole and the recreational opportunities this location provides.

Archaeological/Historical: 85 archaeological sites and one historic cemetery documented on AWMA.

Management Needs: Habitat restoration and improvement; public access and recreational opportunities; hydrological preservation and restoration; exotic and invasive species maintenance and control; imperiled species habitat maintenance, enhancement, and restoration.

Acquisition Needs/Acreage: No acres on the FWC Additions and Inholdings list; 11,134 acres remaining in the nearest Florida Forever Project, the Apalachicola River Florida Forever BOT Project, located six miles from AWMA (Figure 3).

Surplus Lands/Acreage: None

Public Involvement: Management Advisory Group consensus building meeting and Public Hearing (Appendix 13.3)

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

ARC Approval Date _____ BTIITF Approval Date: _____

Comments: _____

Land Management Plan Compliance Checklist

Required for State-owned conservation lands over 160 acres

Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1	The common name of the property.	18-2.018 & 18-2.021	1
2	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	7
3	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	7-8
4	The legal description and acreage of the property.	18-2.018 & 18-2.021	1, Appendix 13.1
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	2, 4, 97, 99
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	74
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	102-103
8	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	12
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)	5
10	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	8-11

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	72
12	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	70-71
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	72-73
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	105
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	Appendix 13.7

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	146
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)	90-94
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	147
19	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	Appendix 13.16
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	74
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	71-72
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	53
23	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(10)	73-74

*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	12, Appendix 13.3
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 13.3
26	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. <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)	12, Appendix 13.3
27	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	Appendix 13.3
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 13.3
29	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>	259.036	N/A
30	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	N/A
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	N/A

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	14-20
33	Insert FNAI based natural community maps when available.	ARC consensus	35-41
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	14-66

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	33-69
36	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	69
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	69
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	14-66
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	85-89
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	14-68, Appendix 13.6
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)	78-141
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.	↓	78-142
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.		78-141
42-C.	The associated measurable objectives to achieve the goals.		109-110
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include fire management plans - they can be in plan body or an appendix.</i>		Appendices: 13.7, 13.8, 13.9, 13.10
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.		142-145, Appendix 13.14
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)	21-53
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).		78-142

44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		94-95
44-C.	Measurable objectives (see requirement for #42-C).		118
44-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
44-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14
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).	↓	78-142
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		86-89
45-C.	Measurable objectives (see requirement for #42-C).		111-112
45-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
45-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14
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)
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 13.15
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).	↓	78-142
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		89-90
48-C.	Measurable objectives (see requirement for #42-C).		115
48-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
48-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14

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	5

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	66, 69
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	21-53
52	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	21
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).	↓	78-142
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		94
53-C.	Measurable objectives (see requirement for #42-C).		117-118
53-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
53-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14

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	69, Appendix 13.7
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	69, Appendix 13.7
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	95, Appendix 13.7
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).	↓	95
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		95
57-C.	Measurable objectives (see requirement for #42-C).		118-119
57-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
57-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14

**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. <i>See footnote.</i>	253.034(5)	96
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).	↓	78-142
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		96
59-C.	Measurable objectives (see requirement for #42-C).		119
59-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
59-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	96
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).	↓	78-142
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		90-94
61-C.	Measurable objectives (see requirement for #42-C).		115-117
61-D.	Related activities (see requirement for #42-D).		Appendices: 13.7, 13.8, 13.9, 13.10
61-E.	Budgets (see requirement for #42-E).		142-145, Appendix 13.14

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
63	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	i
64	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	74-78
65	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032(10)	78-142

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)	142-145, Appendix 13.14
67	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032(10)	142-145, Appendix 13.14
68	A statement of gross income generated, net income and expenses.	18-2.018	72, 142-145, Appendix 13.14

*** = 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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1 Introduction and General Information

Set within a picturesque landscape of rolling upland forests, farms, rivers, and lakes in northwest Florida, the Apalachee Wildlife Management Area (AWMA) conserves important upland pine forests, floodplain forests, marshes and swamps within the Chattahoochee and Flint River systems that form the headwaters of the Apalachicola River. Located along the western shoreline of the Chattahoochee River and Lake Seminole in Jackson County, AWMA comprises approximately 7,952 acres (Figure 1). Chief among its many attributes, AWMA provides essential water quality protection and wildlife habitat for an array of imperiled, and other native wildlife including the gopher tortoise, Florida pine snake, fox squirrel, and northern bobwhite among others, as well as exceptional recreational opportunities.

The AWMA is owned by the U.S. Army Corps of Engineers (ACOE) and is managed by the Florida Fish and Wildlife Conservation Commission (FWC) for the conservation of imperiled and more common wildlife and for fish and wildlife based public outdoor recreation. The majority of the area is managed to conserve the important natural communities on site that provide habitat for a wide range of imperiled and more common wildlife species. However,



AWMA, *David Moynahan*

a percentage of the area is retained in agricultural fields in accordance with the ACOE license of the area to the FWC to maintain areas of traditional agricultural use. Other portions of the area are maintained in early successional habitat and wildlife openings, primarily for quail management and to provide high-quality opportunities for hunting.

County Road (CR) 271 (River Road) bisects much of AWMA and provides easy public access to enjoy wildlife viewing year round on the area's verdant forests, at Lake Seminole, and along the Chattahoochee River. Additional recreational opportunities offered on the area include fishing, horseback-riding, boating, paddling, and hiking. The established boundary of AWMA encompasses two separate parcels and is divided into three management Zones (A, B, C) that lie along the eastern boundary of Jackson County. The largest, Zone A, has approximately 525 acres of agricultural fields and encompasses many types of habitat: wetlands and ponds, rich bottomlands, and open stands of stately longleaf pines that tower over the wiregrass on upland areas. The majority of management activities conducted by the FWC are done in Zone A. Zones B and C are primarily upland hardwood forest, bottomland forest, upland mixed woodland, and floodplain swamp.

The FWC has lead management authority for all of the resources on AWMA with the exception of timber harvesting and the associated revenues derived from it which are

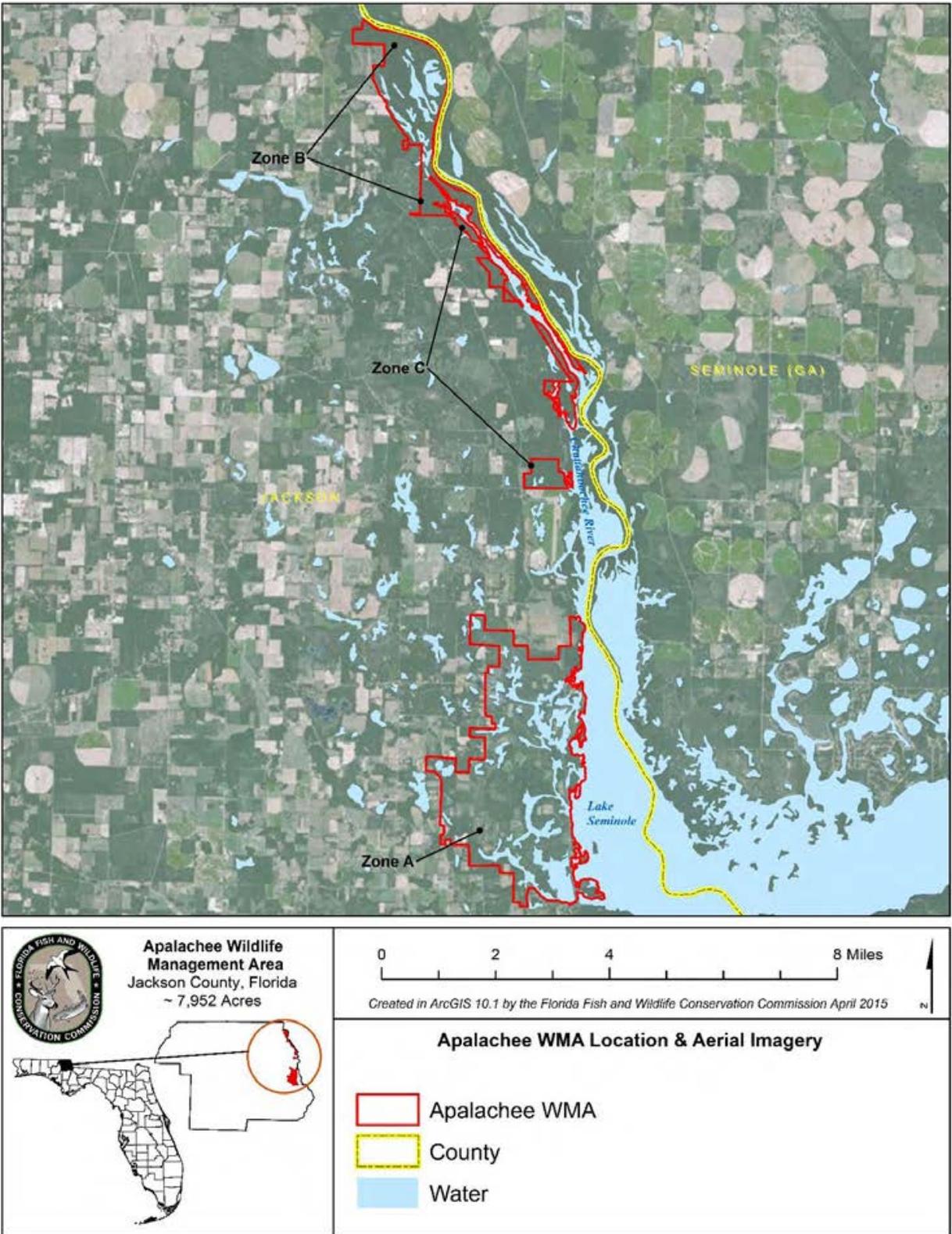


Figure 1. AWMA location and aerial imagery

reserved by the ACOE. The AWMA is managed to conserve and restore natural wildlife habitat, and to provide high-quality opportunities for hunting, fishing, wildlife viewing, and other fish and wildlife-based public outdoor recreation opportunities.

1.1 Management Plan Purpose

This Management Plan serves as the basic statement of policy and direction for the management of AWMA. It provides information including the past usage, conservation acquisition history, and descriptions of the natural and cultural resources found on AWMA. Furthermore, it identifies the FWC's future management intent, goals and associated short and long-term objectives, as well as identifying challenges and solutions. This Management Plan has been developed to guide each aspect of AWMA's management for the next ten years.

This Management Plan is submitted for review to the Acquisition and Restoration Council (ARC) acting on behalf of the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees) of the State of Florida through the Florida Department of Environmental Protection's Division of State Lands (DEP-DSL) pursuant to Chapters 253 and 259, Florida Statutes (Fla. Stat.), and Chapters 18-2 and 18-4, Florida Administrative Code (FAC) and to the ACOE pursuant to License Agreement DACW01-3-05-0028 (Appendix 13.1). Format and content were drafted in accordance with ARC requirements for management plans and the model plan outline provided by the staff of the DSL. Terms (Appendix 13.2) used in this Management Plan describing management activities and associated measurable goals and objectives conform to those developed for the Land Management Uniform Accounting Council Biennial Land Management Operational Report.

Although the lands covered by this Management Plan are not titled to the Board of Trustees, this Plan is being submitted to the ARC and Board of Trustees for review and approval for a variety of important reasons. Foremost among these, is that the FWC has determined that it is essential for all of the conservation areas that it manages, including those lands titled to agencies other than the Board of Trustees, to have conservation land management plans that are in conformance with the State's statutory framework and criteria for the development of management plans for state-owned conservation lands. This ensures that each conservation area that FWC manages has a comprehensive, consistent, accountable, land management plan that is developed under and meets the current ARC, Board of Trustees, and FWC planning framework and requirements.

Further, AWMA is included on the list of FWC-managed conservation lands that receive funding through the Conservation and Recreation Lands (CARL) land management funding formula. Moreover, in order for a public conservation area to continue to qualify to receive land management funding through the CARL land management funding formula, the area is required to have an ARC and Board of Trustees approved land management plan that meets the State's management plan requirements for state-owned conservation lands. For

these reasons, this Management Plan is submitted and required to meet the ARC and Board of Trustees criteria for approval. Moreover, this Management Plan will also be submitted to the ACOE for review and approval in keeping with the terms of the license agreement.

1.1.1 FWC Planning Philosophy

The FWC’s planning philosophy includes emphasizing management recommendation consensus-building among stakeholders and input from user groups and the general public at the beginning of the planning process. The FWC engages stakeholders by convening a Management Advisory Group (MAG) and solicits additional input from user groups and the general public at a public hearing (Appendix 13.3). The FWC also engages area, district, and regional agency staff, as well as other FWC staff expertise, in developing this Management Plan, thereby facilitating area biologist and manager “ownership” of the Management Plan, and thus the development of meaningful management intent language, goals with associated measurable objectives, timelines for completion, and the identification of challenges and solution strategies for inclusion in the AWMA Management Plan (Sections 5 – 8).

Furthermore, FWC maintains transparency and accountability throughout the development and implementation of this Management Plan. A “living document” concept, linking this updated Management Plan to the previous one, is accomplished by reporting on the objectives, management activities, and projects accomplished over the last planning timeframe (see Section 4), thereby ensuring agency accountability through time. Also, in an effort to remain adaptive for the duration of this Management Plan, continuous input and feedback will be collected from FWC staff, stakeholders, user groups, and other interested parties and individuals. As needed, amendments to this Management Plan will be presented to the DSL and the ARC for review and consideration.

1.2 Location

The AWMA is located west of the Chattahoochee River and Lake Seminole, between three and 15 miles north of Sneads in northeastern Jackson County. The area stretches over 15 miles from north to south, beginning just south of State Road 2 at the north end of Zone B and continuing to Lake Seminole Road at the southern border of Management Zone A. Zone B is approximately three miles from the Alabama state line. Both Zones B and C are across the Chattahoochee River from the Georgia state line. Zone A is the southernmost parcel located three miles south of Zone C



Lake at AWMA, David Moynahan

in multiple sections in Township 5N, Range 7W and Township 4N, Range 8W. Zone A is located approximately four miles northeast of Grand Ridge and 15 miles east of Marianna. County Road 271 traverses the eastern portion of Zone A, with Lake Seminole located immediately east. Three Rivers State Park is located immediately southeast of Zone A along Lake Seminole.

Management Zones B and C are located three to 10 miles north of Zone A and lie between CR 271 and the Chattahoochee River in multiple sections of Township 5N, Range 7W; Township 6N, Ranges 7W and 8W; and Township 7N, Range 8W (Figure 2). Seminole County, Georgia is located across from the area on the eastern side of the Chattahoochee River. No part of the AWMA is within or adjacent to an Area of Critical State Concern (Chapter 380.05 Fla. Stat.) or an aquatic preserve.

1.3 Acquisition

1.3.1 Purpose for Acquisition of the Property

The Lake Seminole project, originally authorized as the Jim Woodruff Lock and Dam Project by the River and Harbor Act of 1946, was the first of three locks and dams constructed for navigation, hydro-power, recreation and related purposes on the Apalachicola, Chattahoochee, and Flint River systems. Construction of this multi-purpose project began in 1947 and was completed in 1957. Lake Seminole borders both Georgia and Florida and has 37,500 acres of water and over 18,000 acres of surrounding land. The general purpose for acquisition and



Lake Seminole, ACOE

management of the lands within AWMA is described in the original license agreement: “whenever waters of any stream or other body of water are impounded, diverted, or otherwise controlled for any purpose whatever by any department or agency of the United States, adequate provision consistent with the primary purposes of such impoundment, diversion, of other control shall be made for the use thereof, together with any areas of land, for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereof.”

Accordingly, the AWMA is managed by the FWC for the purpose of operating a Wildlife Management Area, providing ecological diversity, providing managed habitat for both common and imperiled wildlife, and for providing the public with fish and wildlife-oriented outdoor recreational opportunities.

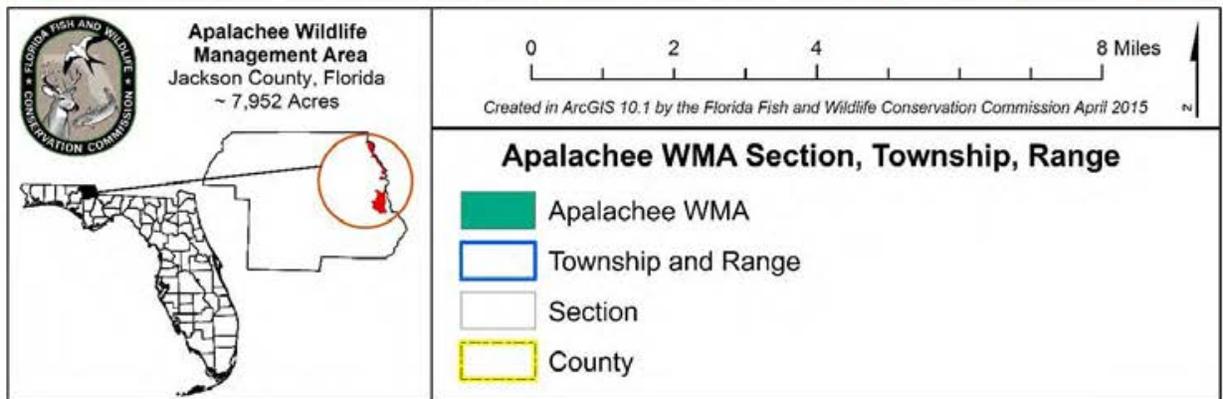
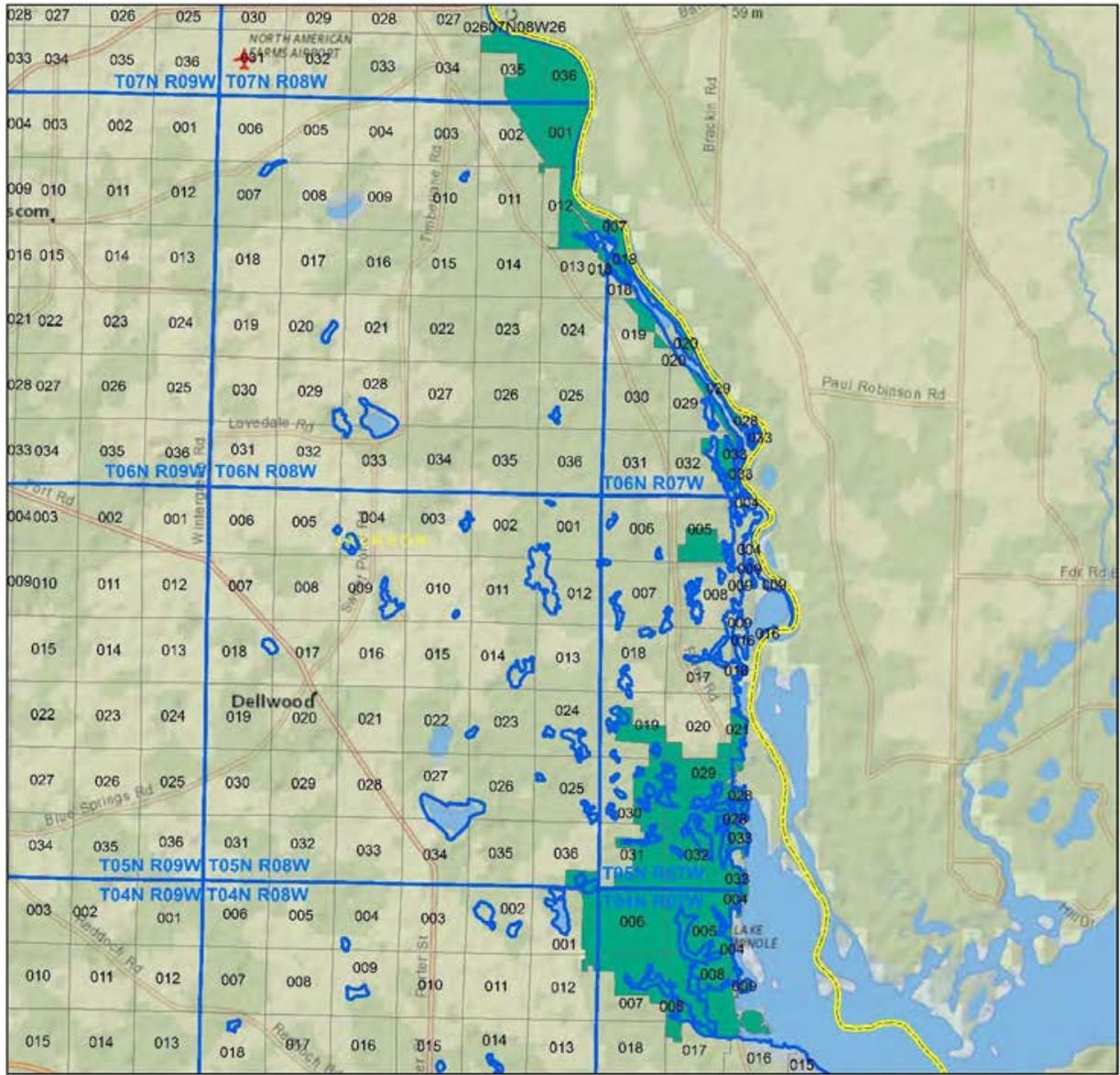


Figure 2. AWMA - Section, Township, Range

1.3.2 Acquisition History

The ACOE acquired title to the public land along the lake shores and river that are encompassed within and adjacent to the AWMA in 1946 as a part of the ACOE's Lake Seminole Project described above. The area was established as AWMA when these lands were subsequently designated for wildlife management by the ACOE and in 1955 when the initial 5,027.25 acres of the area were leased to the FWC, then the Florida Game and Fresh Water Fish Commission (GFC), by the ACOE following completion of Jim Woodruff Lock and Dam below the confluence of the Chattahoochee and Flint Rivers. Approximately 255.8 acres were subsequently added to the original parcel between 1955 and 1985. A separate unit of 2,669 acres of bottomland hardwoods was added in 1987. Located 10 miles north of the original parcel (Zone A), this area lies between CR 271 and the Chattahoochee River, and is accessible only on foot or by boat. The original parcel was designated as Zone A. The river bottom parcels were designated as Zones B and C.

1.4 Management Authority

The FWC is the designated lead managing agency for AWMA under the authority granted by License Number DACW01-3-05-0028 from the ACOE. Further management authority derives from Article IV, Section 9 of the Florida Constitution as well as the guidance and directives of Chapters 253, 259, 327, 370, 372, 375, 378, 379, 403, 487, 597, and 870 of the Fla. Stat. These constitutional provisions and laws provide FWC the authority to protect, conserve, and manage the State's fish and wildlife resources.

1.5 Management Directives

The General Plan for the Use of Project Land and Water Areas for Wildlife Conservation and Management of Jim Woodruff Dam and Reservoir (the original license agreement) states that "whenever waters of any stream or other body of water are impounded, diverted, or otherwise controlled for any purpose whatever by any department or agency of the United States, adequate provision consistent with the primary purposes of such impoundment, diversion, of other control shall be made for the use thereof, together with any areas of land, for the



AWMA entrance sign and kiosk, FWC

conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereof..."(Appendix 13.1). The license agreement grants the FWC a license for fish and wildlife activities over, across, in and upon 7,952 acres.

1.6 Title Interest and Encumbrances

The ACOE holds the fee title interest to all lands within the AWMA. In March 2005, the

ACOE renewed License Number DACW01-3-05-0028, granting the FWC management authority for AWMA through February 2030. As described above, the FWC has lead management authority and responsibility on all lands established within the boundary of AWMA with the exception of timber resources which are managed by the ACOE.

In accordance with the ACOE license agreement with the FWC, a percentage of the AWMA is retained in agricultural fields to maintain traditional agricultural use of the lands. Therefore, the FWC administers many farming agreements and contracts for the AWMA (Appendix 13.4). Forty-nine agricultural fields, ranging in size from 2.4 to 26.4 acres, totaling approximately 525 acres are located in management Zone A. Twenty-one (approximately 227 acres) of these fields are leased to local farmers under a long-term sharecrop contract at no-cost. Fifteen fields totaling approximately 169 acres were allocated for a revenue contract lease with revenues going to the FWC. The FWC maintains the remaining 13 fields, totaling approximately 129.6 acres, for supplemental wildlife food sources and dove fields.



AWMA, FWC

In 1958, the ACOE granted Jackson County an easement on approximately 57 acres for maintenance of a drainage ditch system. There is one housing agreement in place for use of a staff residence on AWMA (Appendix 13.4). These agreements and contracts do not impede FWC’s management objectives and authority as described in Sections 1.4 and 1.5.

1.7 Proximity to Other Public Conservation Lands

The AWMA is located in the vicinity of an extensive network of conservation lands, including lands managed by the Northwest Florida Water Management District (NFWFMD), the DEP and Jackson County. Several Florida Forever projects (Figure 3) are also located in the vicinity of the area.



White-tailed deer at AWMA, FWC

Tables 1 and 2 list the conservation lands and Florida Forever projects within a 20-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 in full-fee by a public entity. However, some of these areas fall within a less-than-fee ownership classification where the land is owned and being managed by a private landowner while a public agency or not-for-profit organization holds a conservation easement on the land.

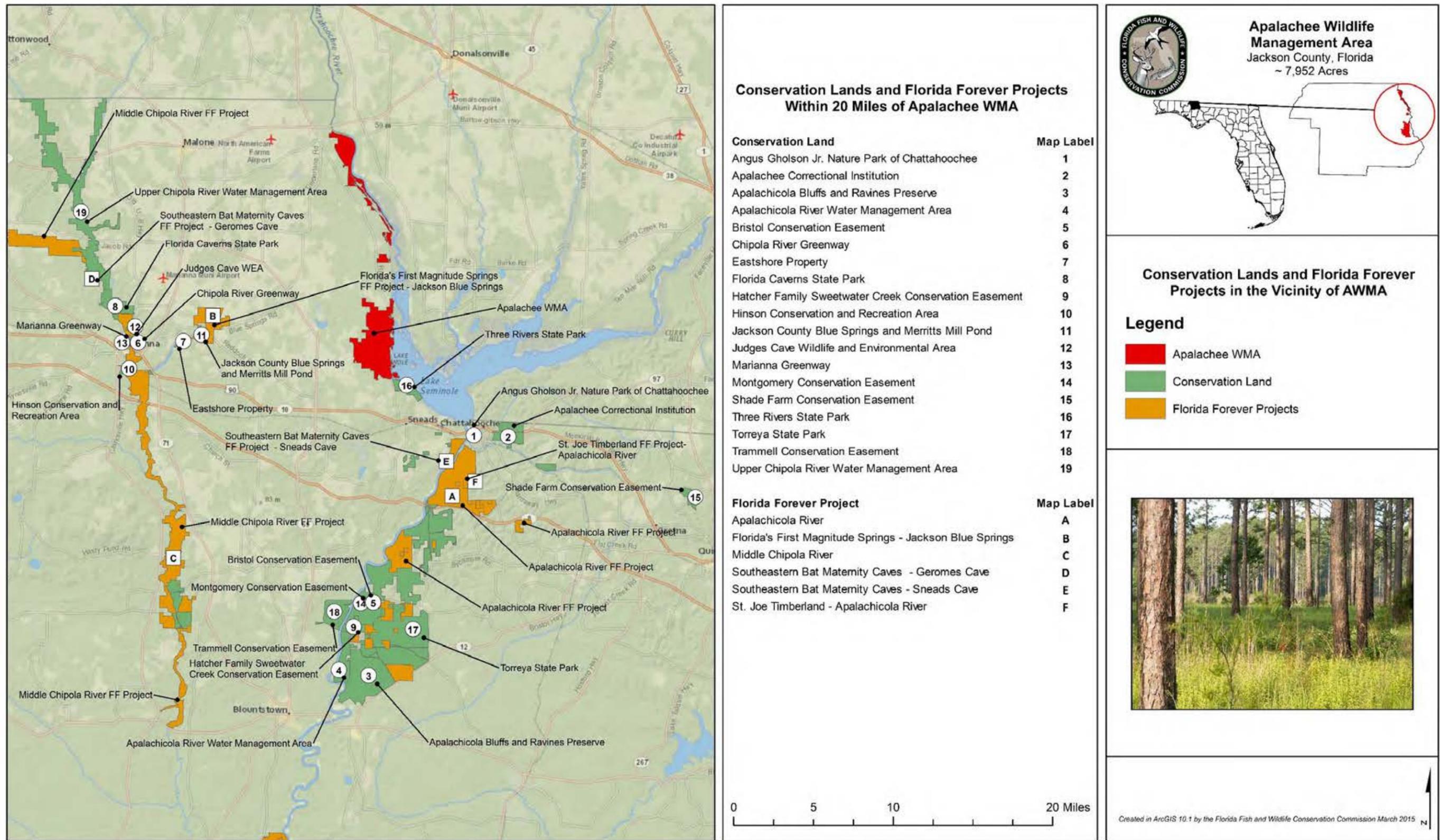


Figure 3. Conservation Lands and Florida Forever Projects Near AWMA

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Table 1. Conservation Lands in the Vicinity (20 Miles) of AWMA

State of Florida	Managing Agency
Apalachee Correctional Institution	PRIDE Enterprises, Inc.
Florida Caverns State Park	DEP-DRP
Hatcher Family Sweetwater Creek Conservation Easement	DEP-DSL
Judges Cave Wildlife and Environmental Area	FWC
Three Rivers State Park	DEP-DRP
Torreya State Park	DEP-DRP
Water Management District	Managing Agency
Apalachicola River Water Management Area	NWFWMD
Trammell Conservation Easement	NWFWMD
Upper Chipola River Water Management Area	NWFWMD
City/County	Managing Agency
Angus Gholson Jr. Nature Park of Chattahoochee	City of Chattahoochee
Chipola River Greenway	Jackson County
Eastshore Property	Jackson County
Hinson Conservation and Recreation Area	City of Marianna
Jackson County Blue Springs and Merritts Mill Pond	Jackson County
Marianna Greenway	City of Marianna
Public/Private Conservation Organization	Managing Agency
Apalachicola Bluffs and Ravines Preserve	TNC
Bristol Conservation Easement	TNC
Montgomery Conservation Easement	TNC
Shade Farm Conservation Easement	Tall Timbers Research, Inc.

Abbreviations: DRP-Division of Recreation and Parks; PRIDE-Prison Rehabilitative Industries and Diversified Enterprises; TNC-The Nature Conservancy

Table 2. Florida Forever Projects in the Vicinity (20 Miles) of AWMA

Project Name	GIS Acres
Apalachicola River Florida Forever BOT Project	18,876.0
Florida's First Magnitude Springs Florida Forever BOT Project - Jackson Blue Springs	2,078.2
Middle Chipola River Florida Forever BOT Project	14,552.2
Southeastern Bat Maternity Caves Florida Forever BOT Project - Geromes Cave	264.7
Southeastern Bat Maternity Caves Florida Forever BOT Project - Sneads Cave	41.6
St. Joe Timberland Florida Forever BOT Project - Apalachicola River	9,665.3

1.8 Adjacent Land Uses

The AWMA is located in Jackson County in the northwest Florida. The current land use designations for areas directly adjacent to and surrounding AWMA are conservation, agriculture, recreation and residential. The closest incorporated area to the AWMA is the town of Sneads. The immediate area in the vicinity of AWMA, with the exception of Sneads and Chattahoochee, is largely rural in character and composed of farms, timber lands and conservation lands with rural residences interspersed among them. Much of the eastern border of AWMA is located along Lake Seminole and the Chattahoochee River. Three Rivers State Park is located immediately southeast of AWMA.

Jackson County does not utilize specific zoning categories for land use. Instead, the County relies on the policies stated in the Future Land Use Element (FLUE) of the adopted Comprehensive Plan and the land use categories defined therein. The current land use designation for AWMA, as described in the FLUE, is conservation and recreation.

The 2013 U.S. Census population estimate for Jackson County was 48,987 residents. The 2013 population estimate for the city of Marianna was 9,320. The U.S. Census 2010 population estimate for Sneads was 1,849 people. The Bureau of Economic and Business Research (BEBR) produces Florida's official state and local population estimates and projections. The BEBR's medium-range population projection for Jackson County in 2025 is 51,300 residents. The BEBR's medium-range 2025 population projections for the counties bordering Jackson County is 27,400 residents in Washington County, 21,000 residents in Holmes County, 15,900 residents in Calhoun County, and 50,100 residents in Gadsden County.

According to the Jackson County Comprehensive Plan's future land use map, the AWMA will continue to be zoned as Conservation land. Land zoned for Conservation allows for one dwelling unit per 40 acres. Jackson County's future land use map shows that the surrounding property will be zoned as Agriculture-1, Agriculture-2, Conservation, and Rural Villages. Agriculture-1 allows for one dwelling unit per 20 acres while Agriculture-2 allows for one dwelling unit per acre.

1.9 Public Involvement

The FWC conducted the AWMA MAG Meeting in Chattahoochee, Florida on June 5, 2013 to obtain input from both public and private stakeholders regarding management of AWMA. The results of the AWMA MAG Meeting were used by the FWC to develop management goals and objectives and to identify opportunities and strategies for inclusion in this Management Plan. A summary of issues and recommendations raised by the AWMA MAG, as well as a listing of participants, is included as Appendix 13.3.

Additionally, a public hearing, as required by Chapter 259.032(10), Fla. Stat., was held in Marianna, Florida on July 17, 2013. The report of that public hearing is also contained in Appendix 13.3. A website is also maintained for receipt of public input at

<http://myfwc.com/conservation/terrestrial/management-plans/develop-mps/>. Additional public testimony and input is received at a public hearing held by the ARC when the AWMA Management Plan is considered for approval. Input received from all public involvement efforts has been considered in the development of this Management Plan.

2 Natural and Cultural Resources

2.1 Physiography and Topography

The AWMA is located in the Marianna lowlands physiographic province. Zone A has an elevation ranging from 70 feet to 110 feet National Geodetic Vertical Datum (NGVD). The southwest border, the southwest area, the northeast area, and the southern border of Zone A have elevations reaching 100 or more feet NGVD. The central portion of Zone A is between 80 and 90 feet in elevation. The lowest lying area in Zone A is in the northwest area at 70 feet. Zone B has an elevation that ranges from 70 to 100 feet NGVD. The lowest lying areas at 70 feet are in the northern most part of Zone B. The highest points of elevation in Zone B are in the northwest corner and west edge of the central portion of Zone B at 100 feet NGVD. The rest of the AWMA is between 80 to 90 feet in elevation. Zone C has an elevation between 80 and 90 feet NGVD.

2.1.1 Climate

Jackson County experiences a warm humid climate, with long, warm summers and mild to cool winters.¹ The temperature at Woodruff Dam, located southeast of AWMA at the Florida/Georgia state line, during the period of 1956 to 2012 ranged from an average annual minimum of 56.2 degrees Fahrenheit (F) to an average annual maximum of 80.6 degrees F. January had the lowest average temperature at 50.3 degrees F. The highest average temperature occurred during July at 81.3 degrees F. The average annual temperature for the period of record was 67.0 degrees F.²

Average total annual precipitation during the period of 1956 to 2012 was 51.77 inches, during which the period rainfall was highest during the month of July (5.47 inches) and lowest in November (2.48 inches). The wet season normally extends from June (4.78 inches) to September (5.05 inches), while winter and fall are normally considered to be drier seasons.

2.1.2 Soils

The Natural Resource Conservation Service (NRCS) soils maps displaying the AWMA's soil series and depth to water table are presented as Figures 4-7. Soils series descriptions were developed using NRCS geographic information system (GIS) data for AWMA and are included as Appendix 13.5. Zone A contains a greater diversity of soils types than Zones B and C. Thirty-six soils series are present on Zone A. Soils with the greatest coverage of Zone A are Hornsville fine sandy loam, 2 to 5 percent slopes (13.0%); Blanton coarse sand, 0

to 5 percent slopes (10.8%); Duplin fine sandy loam, 2 to 5 percent slopes (8.4%); Compass loamy sand, 2 to 5 percent slopes (6.0%); Troup sand, 0 to 5 percent slopes (5.6%); and Orangeburg loamy sand, 2 to 5 percent slopes (4.8%). Hornsville fine sandy loam, Blanton coarse sand, Compass loamy sand, and Duplin fine sandy loam are moderately well drained soils. Orangeburg loamy sand and Troup sand are well drained soils.

Ten soil series are present on Zones B and C, the largest coverage being Apalachee clay at 67.1%. Other soils with the greatest coverage of Zones B and C include Bethera silt loam (9.7%); Hornsville fine sandy loam, 2 to 5 percent slopes (6.3%); Duplin fine sandy loam, 2 to 5 percent slopes (5.8%); and Hornsville fine sandy loam, 0 to 2 percent slopes (4.4%). Apalachee clay and Bethera silt loam drain poorly. As noted above, Hornsville and Duplin fine sandy loam drain moderately well.

2.1.3 Geologic Conditions

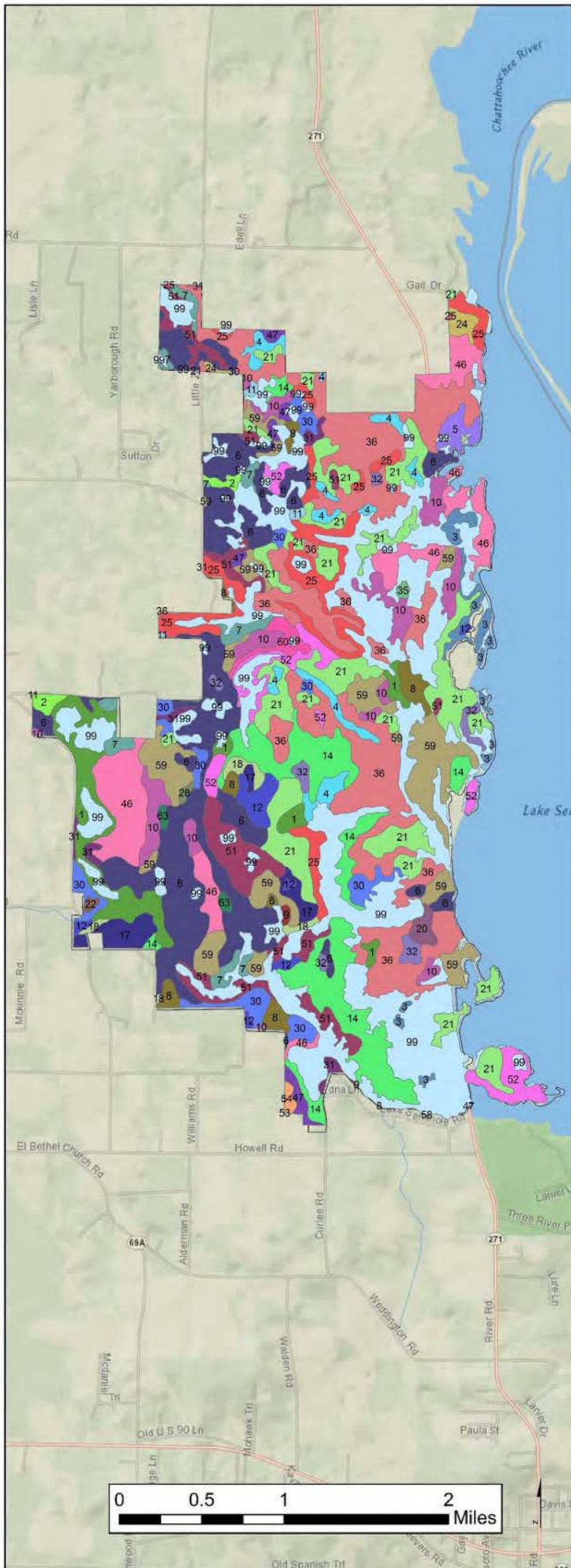
The geology at AWMA is divided into three groups at the surface according to the geologic map of the State of Florida. The first is residuum on Oligocene sediments. It is located in Zones A and C and covers 73% of the management area. It is undifferentiated and mapped on parts of the Chattahoochee “Anticline”, which consists of reddish brown, variably sandy clay with inclusions of variably fossiliferous, silicified limestone (Huddlestun, 1993). The residuum includes Lower and Upper Oligocene weathered sediments. The lithology of this formation consists of limestone, sand, and clay or mud.³

The second major formation at the surface of AWMA includes residuum on Eocene sediments. This formation is located in Zones B and C and covers 26% of the management area. This formation has post Eocene residuum lying on Eocene sediments which consists of reddish brown, sandy clays and clayey sands with inclusions of weathered Eocene limestone. Some inclusions are silicified carbonates. The lithology of this formation consists of sand, clay or mud, and limestone.³

The third formation at the surface of AWMA is residuum on Miocene sediments. It is located in Zone A and covers 1% of the management area. The undifferentiated Miocene residuum, mapped on parts of the Chattahoochee "Anticline", characteristically consists of reddish brown, variably sandy clay with inclusions of variably fossiliferous, silicified limestone. The residuum includes Lower to Upper Miocene and younger weathered sediments. The lithology of this formation consists of claystone, sandstone, and limestone.³

2.2 Vegetation

As noted above, the AWMA is divided into three management Zones (A, B, C). Through the services of the Florida Natural Areas Inventory (FNAI), the FWC mapped the natural communities on Zone A in 2009 and mapped all Zones in April 2015. The FNAI describes 24 natural and altered community types existing on the AWMA, displayed in Table 3. The original parcel, designated as Zone A, is comprised primarily of upland pine, impoundments associated with Lake Seminole, bottomland forest, and agricultural fields.



Legend

Map Symbol; Soil Series

- 1;Alapaha loamy sand
- 2;Albany sand, 0 to 5 percent slopes
- 3;Apalachee clay
- 4;Bethera silt loam
- 5;Bibb soils
- 6;Blanton coarse sand, 0 to 5 percent slopes
- 7;Blanton coarse sand, 5 to 8 percent slopes
- 8;Bonifay sand, 0 to 5 percent slopes
- 9;Bonifay sand, 5 to 8 percent slopes
- 10;Chipola loamy sand, 0 to 5 percent slopes
- 11;Chipola loamy sand, 5 to 8 percent slopes
- 12;Clarendon fine sandy loam
- 14;Compass loamy sand, 2 to 5 percent slopes
- 17;Dothan loamy sand, 2 to 5 percent slopes
- 18;Dothan loamy sand, 5 to 8 percent slopes
- 20;Duplin fine sandy loam, 0 to 2 percent slopes
- 21;Duplin fine sandy loam, 2 to 5 percent slopes
- 22;Esto loamy sand, 2 to 5 percent slopes
- 24;Faceville loamy fine sand, 2 to 5 percent slopes
- 25;Faceville loamy fine sand, 5 to 8 percent slopes
- 28;Foxworth sand, 0 to 5 percent slopes
- 30;Fuquay coarse sand, 0 to 5 percent slopes
- 31;Fuquay coarse sand, 5 to 8 percent slopes
- 32;Grady fine sand loam
- 35;Hornsville fine sandy loam, 0 to 2 percent slopes
- 36;Hornsville fine sandy loam, 2 to 5 percent slopes
- 46;Orangeburg loamy sand, 2 to 5 percent slopes
- 47;Orangeburg loamy sand, 5 to 8 percent slopes
- 51;Plummer sand
- 52;Plummer sand, depressional
- 53;Red Bay fine sandy loam, 0 to 2 percent slopes
- 54;Red Bay fine sandy loam, 2 to 5 percent slopes
- 58;Tifton loamy sand, 5 to 8 percent slopes
- 59;Troup sand, 0 to 5 percent slopes
- 60;Troup sand, 5 to 8 percent slopes
- 63;Wicksburg-Esto complex, 2 to 5 percent slopes
- 99;Water

Apalachee WMA Soils: Zone A

Apalachee Wildlife Management Area
Jackson County, Florida
~ 7,952 Acres

Created in ArcGIS 10.1 by the Florida Fish and Wildlife Conservation Commission April 2015

Figure 4. AWMA Soils - Zone A

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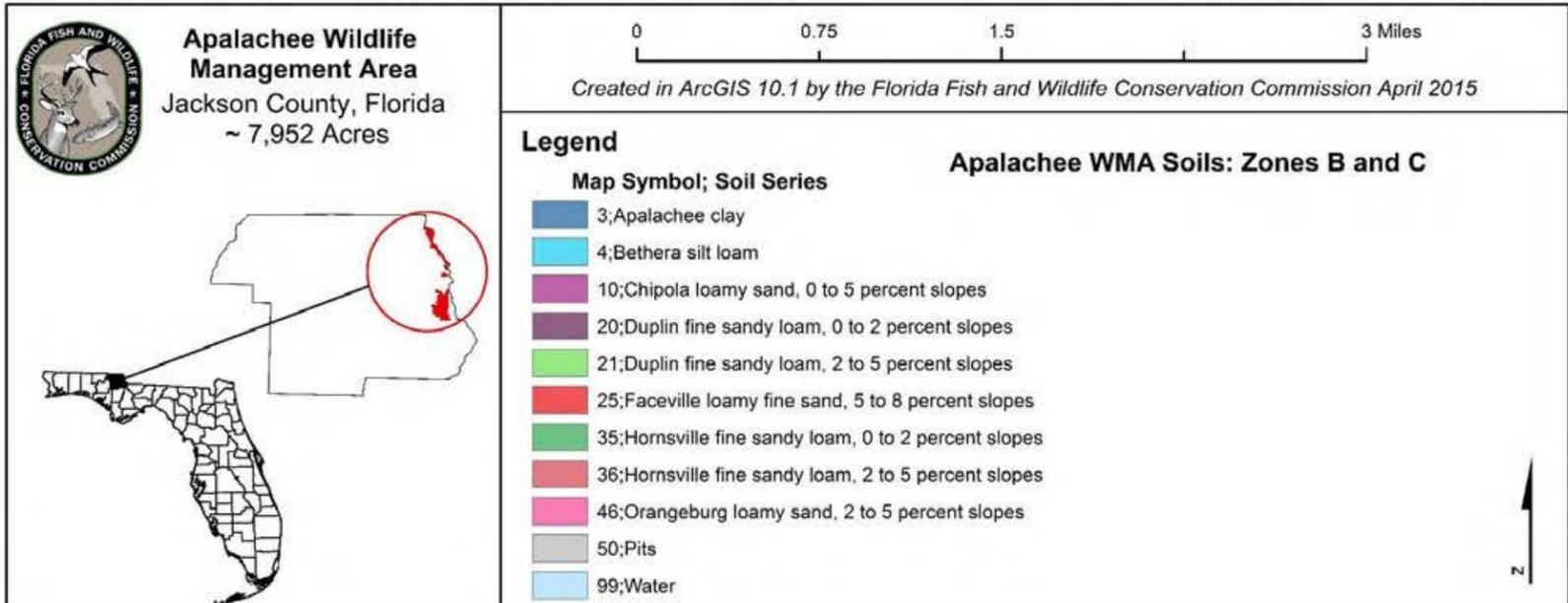
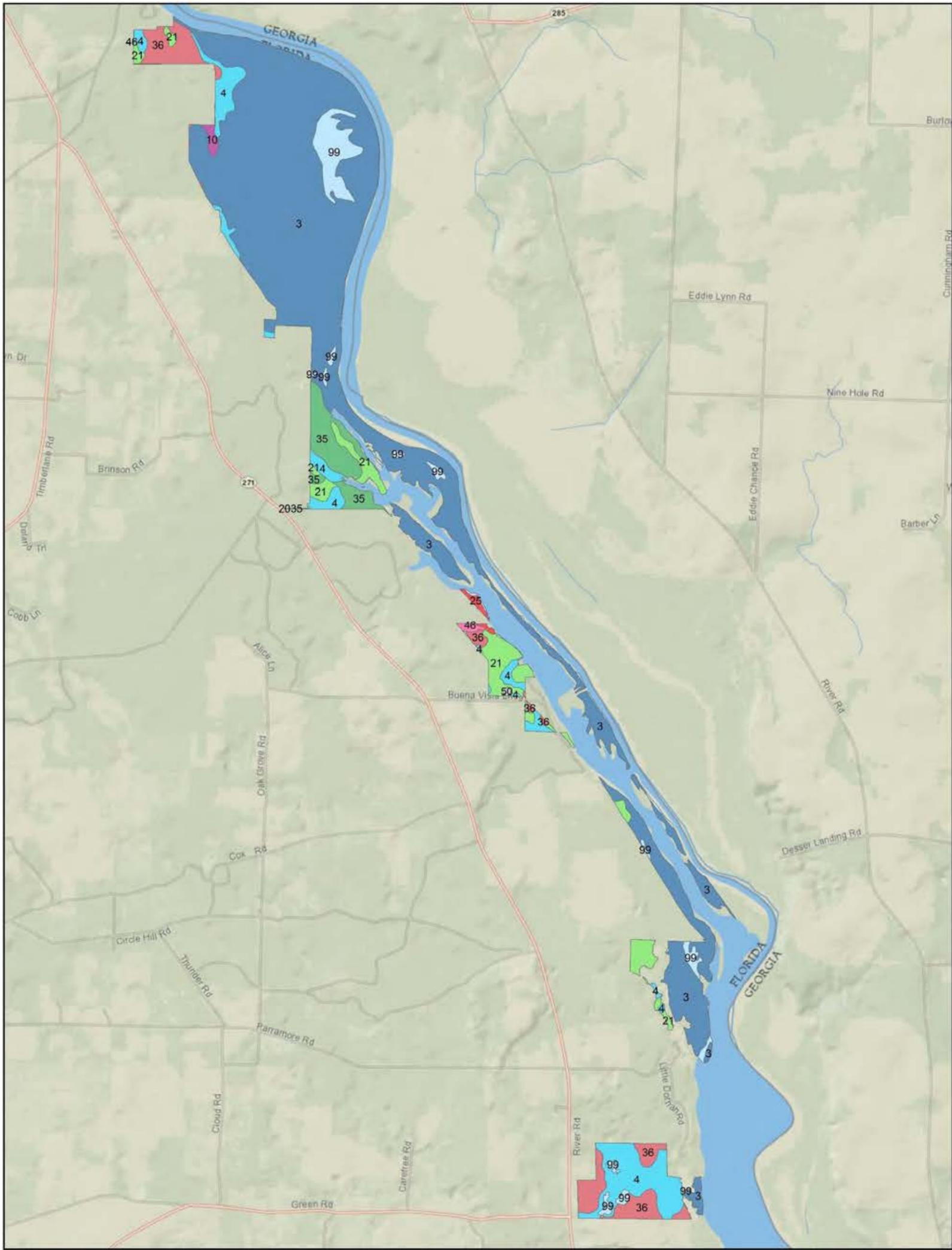


Figure 5. AWMA Soils - Zones B and C

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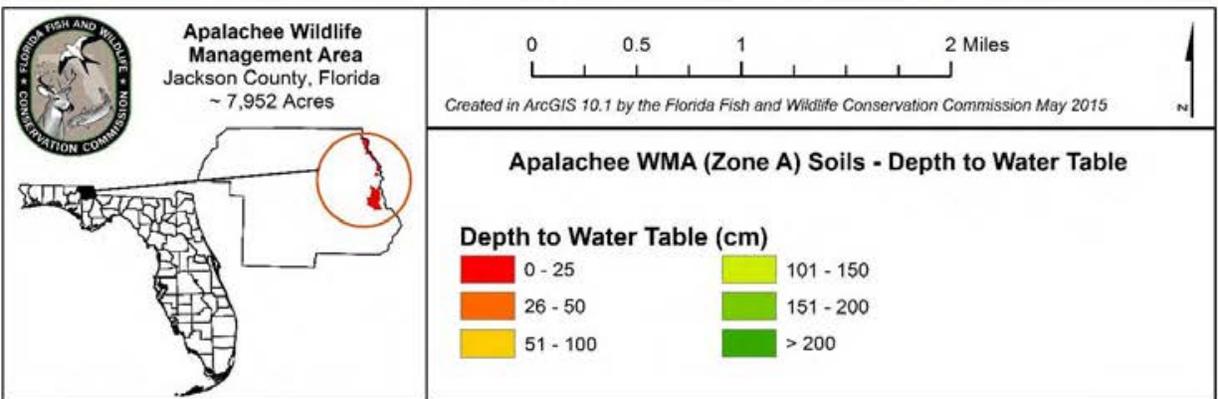
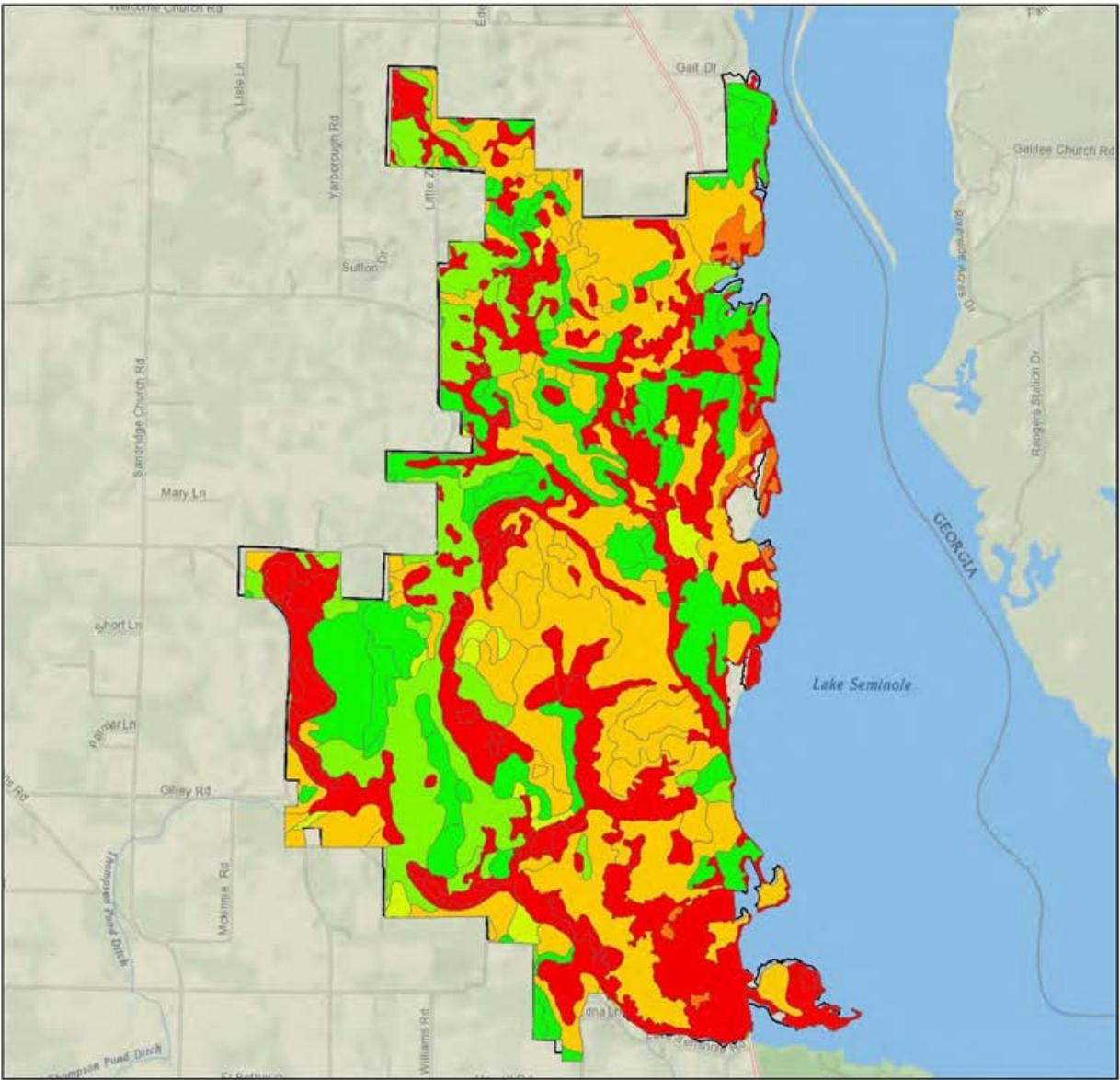


Figure 6. AWMA Soils Zone A- Depth to Water Table

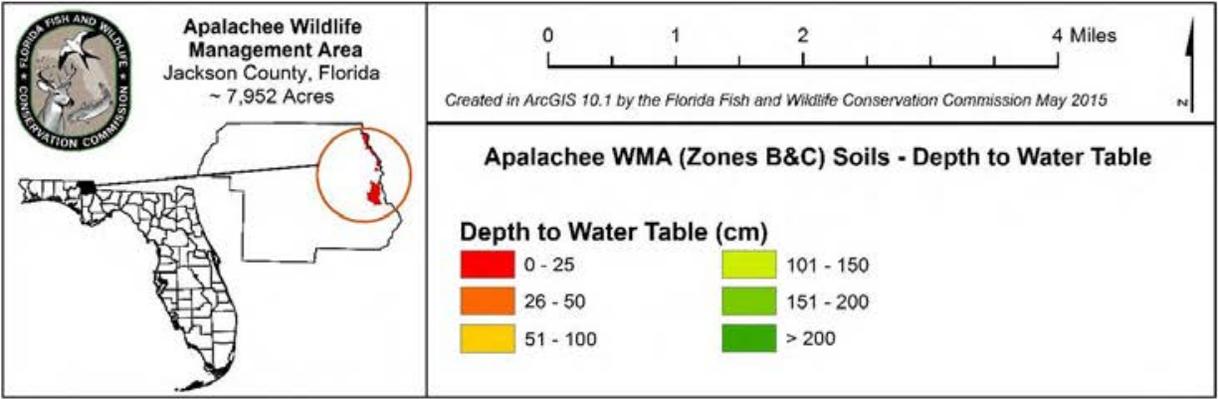
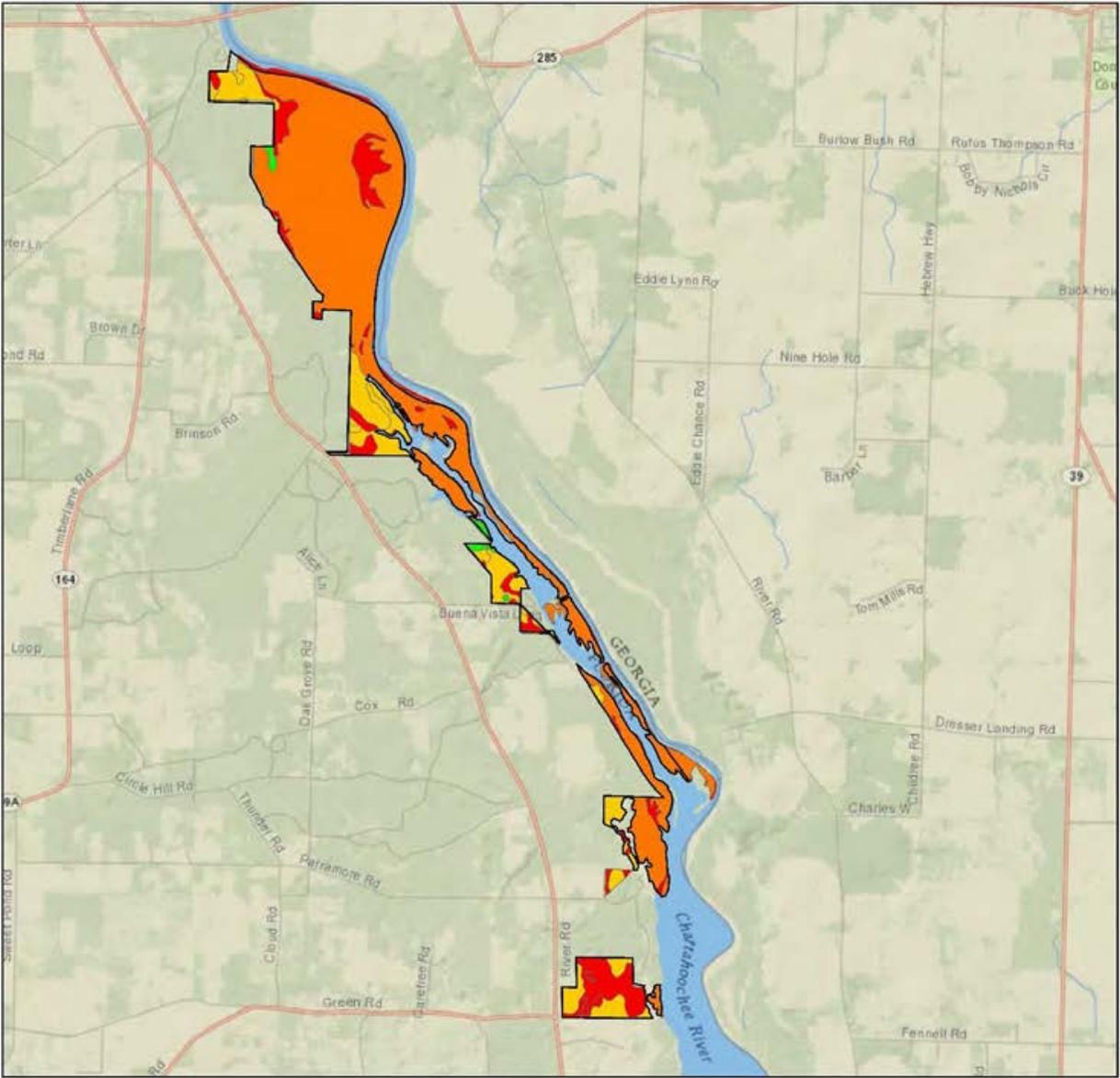


Figure 7. AWMA Soils Zones B and C - Depth to Water Table

Zones B and C, located along the Chattahoochee River have a distinctly different habitat type. They are primarily composed of upland hardwood forest, bottomland forest, floodplain swamps and marsh, upland mixed woodland, and basin marsh. The FNAI has designated areas in Zone A as reference sites for both upland pine and upland mixed woodland communities and has listed the sandhill communities as ground cover restoration donor sites for their exceptional natural quality.



Gentian pinkroot, FWC

In conjunction with natural community mapping, the FWC and the FNAI have assembled an inventory of imperiled plants documented on AWMA (Table 4), native plants (Table 5), and exotic plants (Table 6). Notably, the AWMA contains the largest known population of the federally endangered gentian pinkroot.

Table 3. Natural Communities and Altered Landcover Types at AWMA

Community Type	Acres	Percentage*
Agriculture	700.6	8.9%
Artificial pond	2.8	<0.1%
Basin marsh	94.0	1.2%
Basin swamp	52.1	0.7%
Bottomland forest	1,249.1	15.9%
Canal/ditch	11.4	0.1%
Clastic upland lake	282.5	3.6%
Clearcut pine plantation	7.3	0.1%
Clearing/regeneration	8.4	0.1%
Depression marsh	13.0	0.2%
Developed	7.3	0.1%
Dome swamp	5.7	0.1%
Floodplain marsh	268.8	3.4%
Floodplain swamp	413.3	5.3%
Impoundment	859.6	10.9%
Pine plantation	12.6	0.2%
Road	63.5	0.8%
Sandhill	326.5	4.1%
Sandhill upland lake	38.4	0.5%
Spoil area	1.2	<0.1%
Successional hardwood forest	113.0	1.4%
Upland hardwood forest	1,074.5	13.7%
Upland mixed woodland	519.3	6.6%
Upland pine	1,743.9	22.2%

* FNAI mapped acreage differs from total established acreage due to minor fluctuations between GIS boundary projections and the actual leased acreage.

Table 4. Imperiled Plants Documented at AWMA

Common Name	Scientific Name	Status
Angle pod	<i>Matelea gonocarpos</i>	ST
Barbara's buttons	<i>Marshallia obovata</i>	SE
Cardinal flower	<i>Lobelia cardinalis</i>	ST
Gentian pinkroot	<i>Spigelia gentianoides</i>	SE, FE
Incised groove-bur	<i>Agrimonia incisa</i>	ST
Leopard's bane	<i>Arnica acaulis</i>	SE
Matelea	<i>Matelea</i> sp.	SE
Narrow-leaved trillium	<i>Trillium lancifolium</i>	SE
Poppy mallow	<i>Callirhoe papaver</i>	SE
Pine lily	<i>Lilium catesbaei</i>	ST
Rainlily	<i>Zephyranthes atamasca</i>	ST
Spiked crested coralroot	<i>Hexalectris spicata</i>	SE
Sweet shrub	<i>Calycanthus floridus</i>	SE
Trailing bindweed	<i>Calystegia catesbeiana</i>	SE

Abbreviations: FE - Federally listed Endangered; SE - State listed Endangered; ST - State listed Threatened

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Adam's needle	<i>Yucca filamentosa</i>
American beautyberry	<i>Callicarpa americana</i>
American buckwheatvine	<i>Brunnichia ovata</i>
American elm	<i>Ulmus americana</i>
American hogpeanut	<i>Amphicarpaea bracteata</i>
American holly	<i>Ilex opaca</i>
American lotus	<i>Nelumbo lutea</i>
American pokeweed	<i>Phytolacca americana</i>
American white waterlily	<i>Nymphaea odorata</i>
Angle pod	<i>Matelea gonocarpus</i>
Apalachicola Indiangrass	<i>Sorghastrum apalachicolense</i>
Arrowhead	<i>Sagittaria</i> sp.
Aster	<i>Symphotrichum</i> sp.
Atlantic pigeon-wing	<i>Clitoria mariana</i>
Bald cypress	<i>Taxodium distichum</i>
Barbara's buttons	<i>Marshallia obovata</i>
Basswood	<i>Tilia americana</i>
Beaked panicum	<i>Panicum anceps</i>
Beaksedge	<i>Rhynchospora</i> sp.
Beardtongue	<i>Penstemon</i> sp.

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Bedstraw	<i>Galium</i> sp.
Beggarticks	<i>Bidens alba</i>
Bentawn plumegrass	<i>Saccharum brevibarbe</i> var. <i>contortum</i>
Bitterweed	<i>Helenium amarum</i>
Black cherry	<i>Prunus serotina</i>
Black oak	<i>Quercus velutina</i>
Black willow	<i>Salix nigra</i>
Blackberry	<i>Rubus</i> sp.
Blackeyed Susan	<i>Rudbeckia hirta</i>
Blackgum	<i>Nyssa sylvatica</i>
Blackjack oak	<i>Quercus marilandica</i>
Blazing star	<i>Liatris tenuifolia</i>
Bloodroot	<i>Sanguinaria canadensis</i>
Blue huckleberry	<i>Gaylussacia frondosa</i> var. <i>tomentosa</i>
Blue mistflower	<i>Conoclinium coelestinum</i>
Blue sage	<i>Salvia azurea</i>
Blueberry	<i>Vaccinium</i> sp.
Blue-eyed grass	<i>Sisyrinchium angustifolium</i>
Bluejack oak	<i>Quercus incana</i>
Bluestem	<i>Andropogon</i> sp.
Bluestem	<i>Schizachyrium</i> sp.
Bog white violet	<i>Viola lanceolata</i>
Bracken fern	<i>Pteridium aquilinum</i>
Brazilian vervain	<i>Verbena brasiliensis</i>
Bristleleaf chaffhead	<i>Carphephorus pseudoliatris</i>
Bristly greenbrier	<i>Smilax tamnoides</i>
Broadleaf cattail	<i>Typha latifolia</i>
Broomsedge bluestem	<i>Andropogon virginicus</i>
Bully	<i>Sideroxylon</i> sp.
Bulrush	<i>Scirpus</i> sp.
Bushmint	<i>Hyptis</i> sp.
Butterflyweed	<i>Asclepias tuberosa</i>
Button rattlesnakemaster	<i>Eryngium yuccifolium</i>
Camphorweed	<i>Pluchea</i> sp.
Canadian germander	<i>Teucrium canadense</i>
Canadian toadflax	<i>Linaria canadensis</i>
Candyroot	<i>Polygala nana</i>
Cardinal flower	<i>Lobelia cardinalis</i>
Carolina desertchicory	<i>Pyrrhopappus carolinianus</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Carolina laurelcherry	<i>Prunus caroliniana</i>
Carolina wild petunia	<i>Ruellia caroliniensis</i>
Cat greenbrier	<i>Smilax glauca</i>
Cattail	<i>Typha</i> sp.
Chalky bluestem	<i>Andropogon virginicus</i> var. <i>glaucus</i>
Cherry	<i>Prunus</i> sp.
Cinnamon fern	<i>Osmunda cinnamomea</i>
Clustered bushmint	<i>Hyptis alata</i>
Coastal plain honeycomb	<i>Balduina angustifolia</i>
Coastalplain dawnflower	<i>Stylisma patens</i>
Coastalplain willow	<i>Salix caroliniana</i>
Colicroot	<i>Aletris</i> sp.
Combleaf mermaidweed	<i>Proserpinaca pectinata</i>
Comfortroot	<i>Hibiscus aculeatus</i>
Common blue violet	<i>Viola sororia</i>
Common buttonbush	<i>Cephalanthus occidentalis</i>
Common eveningprimrose	<i>Oenothera biennis</i>
Common marsh pink	<i>Sabatia stellaris</i>
Common moonseed	<i>Menispermum canadense</i>
Common persimmon	<i>Diospyros virginiana</i>
Common ragweed	<i>Ambrosia artemisiifolia</i>
Common wheat	<i>Triticum aestivum</i>
Common winterberry	<i>Ilex verticillata</i>
Coontail	<i>Ceratophyllum demersum</i>
Coral greenbrier	<i>Smilax walteri</i>
Crimsoneyed rosemallow	<i>Hibiscus moscheutos</i>
Crossvine	<i>Bignonia capreolata</i>
Croton	<i>Croton</i> sp.
Crowngrass	<i>Paspalum</i> sp.
Cutleaf eveningprimrose	<i>Oenothera laciniata</i>
Cypress vine	<i>Ipomoea quamoclit</i>
Darrow's blueberry	<i>Vaccinium darrowii</i>
Day flower	<i>Commelina erecta</i>
Deerberry	<i>Vaccinium stamineum</i>
Devil's grandmother	<i>Elephantopus tomentosus</i>
Dock	<i>Rumex</i> sp.
Dog fennel	<i>Eupatorium capillifolium</i>
Dogtongue wild buckwheat	<i>Eriogonum tomentosum</i>
Dogwood	<i>Cornus</i> sp.

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Dollarleaf	<i>Rhynchosia reniformis</i>
Downy lobelia	<i>Lobelia puberula</i>
Dryopteris	<i>Dryopteris</i> sp.
Duckweed	<i>Lemna</i> sp.
Dwarf dandelion	<i>Krigia</i> sp.
Dwarf huckleberry	<i>Gaylussacia dumosa</i>
Dwarf palmetto	<i>Sabal minor</i>
Dwarf St. John's-wort	<i>Hypericum mutilum</i>
Earleaf greenbrier	<i>Smilax auriculata</i>
Eastern hophornbeam	<i>Ostrya virginiana</i>
Eastern poison ivy	<i>Toxicodendron radicans</i>
Eastern poison oak	<i>Toxicodendron pubescens</i>
Eastern redbud	<i>Cercis canadensis</i>
Ebony spleenwort	<i>Asplenium platyneuron</i>
Elderberry	<i>Sambucus nigra</i> ssp. <i>canadensis</i>
Elephant's foot	<i>Elephantopus</i> sp.
Elliott's blueberry	<i>Vaccinium elliotii</i>
Elliott's bluestem	<i>Andropogon gyrans</i>
Elm	<i>Ulmus</i> sp.
False aloe	<i>Manfreda virginica</i>
False foxglove	<i>Agalinis</i> sp.
False gromwell	<i>Onosmodium virginianum</i>
False indigobush	<i>Amorpha fruticosa</i>
False nettle	<i>Boehmeria cylindrica</i>
Fernleaf false foxglove	<i>Aureolaria pedicularia</i>
Flatsedge	<i>Cyperus</i> sp.
Flax	<i>Linum</i> sp.
Fleabane	<i>Erigeron</i> sp.
Floating badderwort	<i>Utricularia inflata</i>
Florida hoary-pea	<i>Tephrosia florida</i>
Florida Keys hempvine	<i>Mikania cordifolia</i>
Florida maple	<i>Acer saccharum</i> ssp. <i>floridanum</i>
Florida phlox	<i>Phlox floridana</i>
Florida yam	<i>Dioscorea floridana</i>
Flowering dogwood	<i>Cornus florida</i>
Forked bluecurls	<i>Trichostema dichotomum</i>
Gallberry	<i>Ilex glabra</i>
Gayfeather	<i>Liatris</i> sp.
Gentian pinkroot	<i>Spigelia gentianoides</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Giant cutgrass	<i>Zizaniopsis miliacea</i>
Goldenaster	<i>Chrysopsis</i> sp.
Goldenrod	<i>Solidago</i> sp.
Gopher apple	<i>Licania michauxii</i>
Grape	<i>Vitis</i> sp.
Grass pink	<i>Calopogon tuberosus</i>
Gray's beaksedge	<i>Rhynchospora grayi</i>
Green arrow arum	<i>Peltandra virginica</i>
Greenbrier	<i>Smilax</i> sp.
Groundsel tree	<i>Baccharis halimifolia</i>
Hairy bedstraw	<i>Galium pilosum</i>
Hairy skullcap	<i>Scutellaria elliptica</i>
Hairy spiderwort	<i>Tradescantia hirsutiflora</i>
Handsome harry	<i>Rhexia virginica</i>
Hawthorn	<i>Crataegus</i> sp.
Hazel alder	<i>Alnus serrulata</i>
Hedgehyssop	<i>Gratiola</i> sp.
Helment skullcap	<i>Scutellaria integrifolia</i>
Hercules' club	<i>Zanthoxylum clava-herculis</i>
Highbush blueberry	<i>Vaccinium corymbosum</i>
Hoary skullcap	<i>Scutellaria incana</i>
Incised groove-bur	<i>Agrimonia incisa</i>
Indiangrass	<i>Sorghastrum</i> sp.
Iris	<i>Iris</i> sp.
Knotweed	<i>Polygonum</i> sp.
Lady lupin	<i>Lupinus villosus</i>
Lanceleaf greenbrier	<i>Smilax smallii</i>
Lanceleaf tickseed	<i>Coreopsis lanceolata</i>
Laurel greenbrier	<i>Smilax laurifolia</i>
Laurel oak	<i>Quercus laurifolia</i>
Leather flower	<i>Clematis crispa</i>
Lemon bacopa	<i>Bacopa caroliniana</i>
Leopard's bane	<i>Arnica acaulis</i>
Lespedeza	<i>Lespedeza</i> sp.
Licoriceweed	<i>Scoparia dulcis</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Littlehip hawthorn	<i>Crataegus spathulata</i>
Littleleaf buckbrush	<i>Ceanothus microphyllus</i>
Live oak	<i>Quercus virginiana</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Lizard's tail	<i>Saururus cernuus</i>
Loblolly pine	<i>Pinus taeda</i>
Longleaf pine	<i>Pinus palustris</i>
Longleaf woodoats	<i>Chasmanthium laxum</i> var. <i>sessiliflorum</i>
Lopsided Indiangrass	<i>Sorghastrum secundum</i>
Lovegrass	<i>Eragrostis</i> sp.
Lyre-leaf sage	<i>Salvia lyrata</i>
Maiden fern	<i>Thelypteris</i> sp.
Maidencane	<i>Panicum hemitomon</i>
Marsh fern	<i>Thelypteris palustris</i> var. <i>pubescens</i>
Marsh mermaidweed	<i>Proserpinaca palustris</i>
Marsh pennywort	<i>Hydrocotyle</i> sp.
Marsh St. John's-wort	<i>Triadenum</i> sp.
Matelea	<i>Matelea</i> sp.
Meadow-beauty	<i>Rhexia</i> sp.
Milk pea	<i>Galactia</i> sp.
Mockernut hickory	<i>Carya tomentosa</i>
Mohr's thoroughwort	<i>Eupatorium mohrii</i>
Moss verbena	<i>Glandularia pulchella</i>
Muscadine	<i>Vitis rotundifolia</i>
Myrtle dahoon	<i>Ilex cassine</i> var. <i>myrtifolia</i>
Nailwort	<i>Paronychia</i> sp.
Narrowfruit horned beaksedge	<i>Rhynchospora inundata</i>
Narrowleaf silkgrass	<i>Pityopsis graminifolia</i>
Narrowleaf sunflower	<i>Helianthus angustifolius</i>
Narrowleaf vervain	<i>Verbena simplex</i>
Narrow-leaved trillium	<i>Trillium lancifolium</i>
Netleaf leather flower	<i>Clematis reticulata</i>
Netted chain fern	<i>Woodwardia areolata</i>
New Jersey tea	<i>Ceanothus americanus</i>
Nutrush	<i>Scleria</i> sp.
Oakleaf hydrangea	<i>Hydrangea quercifolia</i>
Oblongleaf twinflower	<i>Dyschoriste oblongifolia</i>
Pale meadow-beauty	<i>Rhexia mariana</i>
Panicgrass	<i>Panicum</i> sp.
Parsley hawthorn	<i>Crataegus marshallii</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Partridgeberry	<i>Mitchella repens</i>
Passion flower	<i>Passiflora incarnata</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Pear	<i>Pyrus</i> sp.
Pecan	<i>Carya illinoensis</i>
Peelbark St. John's-wort	<i>Hypericum fasciculatum</i>
Peppervine	<i>Ampelopsis arborea</i>
Pickrelweed	<i>Pontederia cordata</i>
Pignut hickory	<i>Carya glabra</i>
Pine lily	<i>Lilium catesbaei</i>
Pinebarren flatsedge	<i>Cyperus retrorsus</i>
Pineland daisy	<i>Chaptalia tomentosa</i>
Pineland scalypink	<i>Stipulicida setacea</i>
Pinewoods milkweed	<i>Asclepias humistata</i>
Pineywoods dropseed	<i>Sporobolus junceus</i>
Pink fuzzybean	<i>Strophostyles umbellata</i>
Pinkscale blazing star	<i>Liatris elegans</i>
Pinweed	<i>Lechea</i> sp.
Pitted stripeseed	<i>Piriqueta cistoides</i> ssp. <i>caroliniana</i>
Plumegrass	<i>Saccharum</i> sp.
Pond cypress	<i>Taxodium ascendens</i>
Poppy mallow	<i>Callirhoe papaver</i>
Possumhaw	<i>Ilex decidua</i>
Post oak	<i>Quercus stellata</i>
Prairie iris	<i>Iris hexagona</i>
Pricklypear	<i>Opuntia humifusa</i>
Primrosewillow	<i>Ludwigia</i> sp.
Prostrate blue violet	<i>Viola walteri</i>
Purple bluestem	<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>
Queen-devil	<i>Hieracium gronovii</i>
Rabbitbells	<i>Crotalaria rotundifolia</i>
Rainlily	<i>Zephyranthes atamasca</i>
Rattan vine	<i>Berchemia scandens</i>
Rattle box	<i>Crotalaria pallida</i>
Rayless sunflower	<i>Helianthus radula</i>
Red buckeye	<i>Aesculus pavia</i>
Red cedar	<i>Juniperus virginiana</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Resurrection fern	<i>Pleopeltis polypodioides</i> var. <i>michauxiana</i>
Rose-mallow	<i>Hibiscus</i> sp.
Roserush	<i>Lygodesmia aphylla</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Rosy camphorweed	<i>Pluchea baccharis</i>
Roundhead lespedeza	<i>Lespedeza capitata</i>
Roundleaf bluet	<i>Houstonia procumbens</i>
Roundleaf greenbrier	<i>Smilax rotundifolia</i>
Roundleaf thoroughwort	<i>Eupatorium rotundifolium</i>
Royal fern	<i>Osmunda regalis</i> var. <i>spectabilis</i>
Running oak	<i>Quercus elliotii</i>
Rush	<i>Juncus</i> sp.
Ryegrass	<i>Lolium</i> sp.
Sand blackberry	<i>Rubus cuneifolius</i>
Sand post oak	<i>Quercus margaretta</i>
Sassafras	<i>Sassafras albidum</i>
Saw greenbrier	<i>Smilax bona-nox</i>
Scaleleaf aster	<i>Symphotrichum adnatum</i>
Sedge	<i>Carex</i> sp.
Sensitive briar	<i>Mimosa quadrivalvis</i>
Sensitive pea	<i>Chamaecrista</i> sp.
Sheep sorrel	<i>Rumex acetosella</i>
Shiny blueberry	<i>Vaccinium myrsinites</i>
Shortleaf pine	<i>Pinus echinata</i>
Showy milkwort	<i>Polygala grandiflora</i>
Showy rattlebox	<i>Crotilaria spectabilis</i>
Shumard's oak	<i>Quercus shumardii</i>
Sidebeak pencil flower	<i>Stylosanthes biflora</i>
Silkgrass	<i>Pityopsis</i> sp.
Silver croton	<i>Croton argyranthemus</i>
Skeletongrass	<i>Gymnopogon</i> sp.
Skyblue lupin	<i>Lupinus diffusus</i>
Slash pine	<i>Pinus elliotii</i>
Slender blazing star	<i>Liatris gracilis</i>
Slender bluestem	<i>Schizachyrium tenerum</i>
Slender flattop goldenrod	<i>Euthamia caroliniana</i>
Slender indiagrass	<i>Sorghastrum elliotii</i>
Slender lespedeza	<i>Lespedeza virginica</i>
Slender threeseed mercury	<i>Acalypha gracilens</i>
Slenderstalk beeblossom	<i>Oenothera filipes</i>
Slimleaf pawpaw	<i>Asimina angustifolia</i>
Small-leaf viburnum	<i>Viburnum obovatum</i>
Small's skullcap	<i>Scutellaria multiglandulosa</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Smooth sumac	<i>Rhus glabra</i>
Snoutbean	<i>Rhynchosia</i> sp.
Soft greeneyes	<i>Berlandiera pumila</i>
Southern arrowwood	<i>Viburnum dentatum</i>
Southern beeblossom	<i>Oenothera simulans</i>
Southern cattail	<i>Typha domingensis</i>
Southern crabapple	<i>Malus angustifolia</i>
Southern cutgrass	<i>Leersia hexandra</i>
Southern magnolia	<i>Magnolia grandiflora</i>
Southern red oak	<i>Quercus falcata</i>
Sowthistle	<i>Sonchus</i> sp.
Spadeleaf	<i>Centella asiatica</i>
Spanish bayonet	<i>Yucca aloifolia</i>
Spanish moss	<i>Tillandsia usneoides</i>
Sparkleberry	<i>Vaccinium arboreum</i>
Sphagnum	<i>Sphagnum</i> sp.
Spider lily	<i>Hymenocallis crassifolia</i>
Spiked crested coralroot	<i>Hexalectris spicata</i>
Spiked hoary-pea	<i>Tephrosia spicata</i>
Spikerush	<i>Eleocharis</i> sp.
Spiny sowthistle	<i>Sonchus asper</i>
Spleenwort	<i>Asplenium</i> sp.
Splitbeard bluestem	<i>Andropogon ternarius</i>
Spurred butterfly pea	<i>Centrosema virginianum</i>
Squarehead	<i>Tetragonotheca helianthoides</i>
St. Andrew's-cross	<i>Hypericum hypericoides</i>
St. John's-wort	<i>Hypericum</i> sp.
Starry rosinweed	<i>Silphium asteriscus</i>
Sugarberry	<i>Celtis laevigata</i>
Summer farewell	<i>Dalea pinnata</i>
Sunflower	<i>Helianthus</i> sp.
Swamp chestnut oak	<i>Quercus michauxii</i>
Swamp dogwood	<i>Cornus foemina</i>
Swamp rose	<i>Rosa palustris</i>
Swamp tupelo	<i>Nyssa sylvatica</i> var. <i>biflora</i>
Sweet everlasting	<i>Pseudognaphalium obtusifolium</i>
Sweet goldenrod	<i>Solidago odora</i>
Sweet shrub	<i>Calycanthus floridus</i>
Sweetbay	<i>Magnolia virginiana</i>

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Sweetgum	<i>Liquidambar styraciflua</i>
Sweet-shrub	<i>Calycanthus floridus</i>
Switchcane	<i>Arundinaria gigantea</i>
Switchgrass	<i>Panicum virgatum</i>
Tall elephantsfoot	<i>Elephantopus elatus</i>
Tall ironweed	<i>Vernonia angustifolia</i>
Tall jointweed	<i>Polygonella gracilis</i>
Thistle	<i>Cirsium</i> sp.
Thoroughwort	<i>Eupatorium</i> sp.
Threeawn	<i>Aristida</i> sp.
Ticktrefoil	<i>Desmodium</i> sp.
Trailing bindweed	<i>Calystegia catesbeiana</i>
Tread softly	<i>Cnidocolus stimulosus</i>
Tree-of-heaven	<i>Ailanthus altissima</i>
Tridens	<i>Tridens</i> sp.
Trumpet creeper	<i>Campsis radicans</i>
Trumpet honeysuckle	<i>Lonicera sempervirens</i>
Turkey oak	<i>Quercus laevis</i>
Vaseygrass	<i>Paspalum urvillei</i>
Violet	<i>Viola</i> sp.
Virginia chain fern	<i>Woodwardia virginica</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Virginia iris	<i>Iris virginica</i>
Virginia plantain	<i>Plantago virginica</i>
Virginia snakeroot	<i>Aristolochia serpentaria</i>
Virginia willow	<i>Itea virginica</i>
Virginsbower	<i>Clematis virginiana</i>
Water horehound	<i>Lycopus</i> sp.
Water oak	<i>Quercus nigra</i>
Water spangles	<i>Salvinia minima</i>
Wavyleaf noseburn	<i>Tragia urens</i>
Wax myrtle	<i>Myrica cerifera</i>
White fringe tree	<i>Chionanthus virginicus</i>
White oak	<i>Quercus alba</i>
White thoroughwort	<i>Eupatorium album</i>
White wild indigo	<i>Baptisia alba</i>
Whitetop aster	<i>Sericocarpus tortifolius</i>
Wild golden glow	<i>Bidens laevis</i>
Willow	<i>Salix</i> sp.

Table 5. Native Plant Species of AWMA

Common Name	Scientific Name
Winged sumac	<i>Rhus copallinum</i>
Wiregrass	<i>Aristida stricta</i> var. <i>beyrichiana</i>
Witchgrass	<i>Dichantheium</i> sp.
Woodland pinkroot	<i>Spigelia marilandica</i>
Woodoats	<i>Chasmanthium</i> sp.
Woodsgrass	<i>Oplismenus hirtellus</i>
Woodsorrel	<i>Oxalis</i> sp.
Woolgrass	<i>Scirpus cyperinus</i>
Woolly pawpaw	<i>Asimina incana</i>
Yankeeweed	<i>Eupatorium compositifolium</i>
Yellow blanket flower	<i>Gaillardia aestivalis</i>
Yellow jessamine	<i>Gelsemium sempervirens</i>
Yellow pondlily	<i>Nuphar advena</i>
Yelloweyed grass	<i>Xyris</i> sp.

Table 6. Exotic Plants Documented on AWMA

Common Name	Scientific Name
Alligatorweed	<i>Alternanthera philoxeroides</i>
Camphor tree	<i>Cinnamomum camphora</i>
Chinaberry tree	<i>Melia azedarach</i>
Chinese privet	<i>Ligustrum sinense</i>
Chinese tallow	<i>Sapium sebiferum</i>
Chinese wisteria	<i>Wisteria sinensis</i>
Coral ardisia	<i>Ardisia crenata</i>
Crape-myrtle	<i>Lagerstroemia indica</i>
Heavenly bamboo	<i>Nandina domestica</i>
Hydrilla	<i>Hydrilla verticillata</i>
Japanese climbing fern	<i>Lygodium japonicum</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Mimosa	<i>Albizia julibrissin</i>
Multiflora rose	<i>Rosa multiflora</i>
Parrot feather water milfoil	<i>Myriophyllum aquaticum</i>
Purple sesban	<i>Sesbania punicea</i>
Shrubby lespedeza	<i>Lespedeza bicolor</i>
Small-leaf spiderwort	<i>Tradescantia fluminensis</i>
Sweet autumn virgins-bower	<i>Clematis terniflora</i>
Taro	<i>Colocasia esculenta</i>
Torpedograss	<i>Panicum repens</i>
Tung oil tree	<i>Aleurites fordii</i>

2.2.1 FNAI Natural Community Descriptions

As described above, the FNAI has detailed a variety of natural and altered community types occurring at AWMA. Upland pine (22.5%), bottomland forest (15.9%), upland hardwood forest (13.7%), upland mixed woodland, (6.6%), floodplain swamp (5.3%), and sandhill (4.1%) cover the majority of AWMA. The largest anthropogenically altered communities on the area are impoundments associated with Lake Seminole (10.9%) and agricultural fields (8.9%). Though altered from the natural state, the area's impoundments and agricultural fields provide quality habitat and food sources for resident and migratory wildlife.

Maps of the current natural communities at AWMA are presented as Figures 8 and 9. The FNAI mapped the historical natural communities for Zone A in 2009 and for all Zones in 2015. Historical natural communities are shown in Figures 10 and 11. Detailed descriptions of natural and altered communities and their associated vegetative assemblages are provided below. The following include generic natural community description excerpts from the FNAI Guide to the Natural Communities of Florida 2010 Edition⁴, and have been modified by the FWC for the purposes of this Management Plan.

Basin marsh (94.0 acres)

Basin marsh is an herb-dominated community that occurs in large, often irregularly shaped depressions. The dominant vegetation type is usually emergent herbs in shallow marsh and floating plants in the deepest areas, with woody plants from adjoining communities typically present in varying densities. Fire-excluded areas support greater numbers of shrubs and trees.

At AWMA, basin marsh occurs as an inclusion in several other wetland habitat. Rising groundwater from the new Lake Seminole inundated some of the historic basin marshes on AWMA, creating clastic and sandhill upland lakes. A net increase in shoreline acreage along the new lake's upper reaches ultimately resulted in more extensive basin marsh habitat. Basin marshes are dominated by herbaceous species ranging from the floating American white waterlily to emergent species such as American lotus, cinnamon fern, royal fern, maidencane, pickerelweed, lizard's tail, broadleaf cattail, netted chain fern, Virginia chain fern, and giant cutgrass. Common basin marsh vines include peppervine, rattan vine, American buckwheatvine, greenbrier, eastern poison ivy, and muscadine.

Woody plants occurring in some basin marshes at AWMA include sweetgum, swamp tupelo, black willow, pond cypress, and bald cypress as canopy or subcanopy trees, and red maple, hazel alder, common buttonbush, and wax myrtle in the shrub layers.

Basin swamp (52.1 acres)

Basin swamp is a forested wetland community that occurs in large irregularly shaped depressions not associated with actively flowing rivers, and is vegetated with hydrophytic

trees and shrubs that can withstand an extended hydroperiod. Basin swamps are highly variable in size, shape, and species composition. Mixed species tree canopies are common, often including both evergreen and deciduous tree species. This natural community typically occurs in any type of large landscape depression such as old lake beds, river basins, and ancient coastal swales and lagoons that existed during higher sea levels.

At AWMA, rising groundwater levels associated with the creation of Lake Seminole combined with fire exclusion in adjoining historic communities has allowed two of the largest basin swamps to increase in size over the past half century. At present, basin swamp is associated with, and grades into, basin marsh and bottomland forest and, upslope, to upland pine.

Dominant plants in the canopy and subcanopy layers of this community type include red maple, sweetgum, swamp tupelo, loblolly pine, laurel oak, water oak, pond cypress, and bald cypress. Basin swamp shrubs include red maple, hazel alder, common buttonbush, wax myrtle, and swamp tupelo. The herb layer is typically sparse and may include sedges, spikerush, southern cutgrass, royal fern, maidencane, narrowfruit horned beaksedge, lizard's tail, maiden fern, and marsh St. John's-wort. Vines include peppervine, American buckwheatvine, greenbrier, eastern poison ivy, and muscadine.

Bottomland forest (1,249.1 acres)

Bottomland forests occur within floodplain forests and swamps on higher ground that is rarely inundated except during unusual flood events. Found in areas intermediate between swamps and uplands, the canopy may be quite diverse with both deciduous and evergreen hydrophytic to mesophytic trees. Bottomland forest is a closed-canopy forest found on terraces and levees within riverine floodplains and in shallow depressions. Bottomland forests along smaller streams are prone to periodic flooding attributable to localized rainfall that increases seepage and runoff from surrounding uplands. In floodplains along larger rivers and tributaries, bottomland forests on higher terraces, ridges, and levees are subject to only short seasonal floods due to high relief or quickly drained sandy soils, or both conditions. The water table in these forests is high in blackwater or spring-fed floodplains, but relatively low during dry periods in alluvial floodplains. Inundation occurs only during higher floods, regardless of the stream type.



Swamp at AWMA, FWC

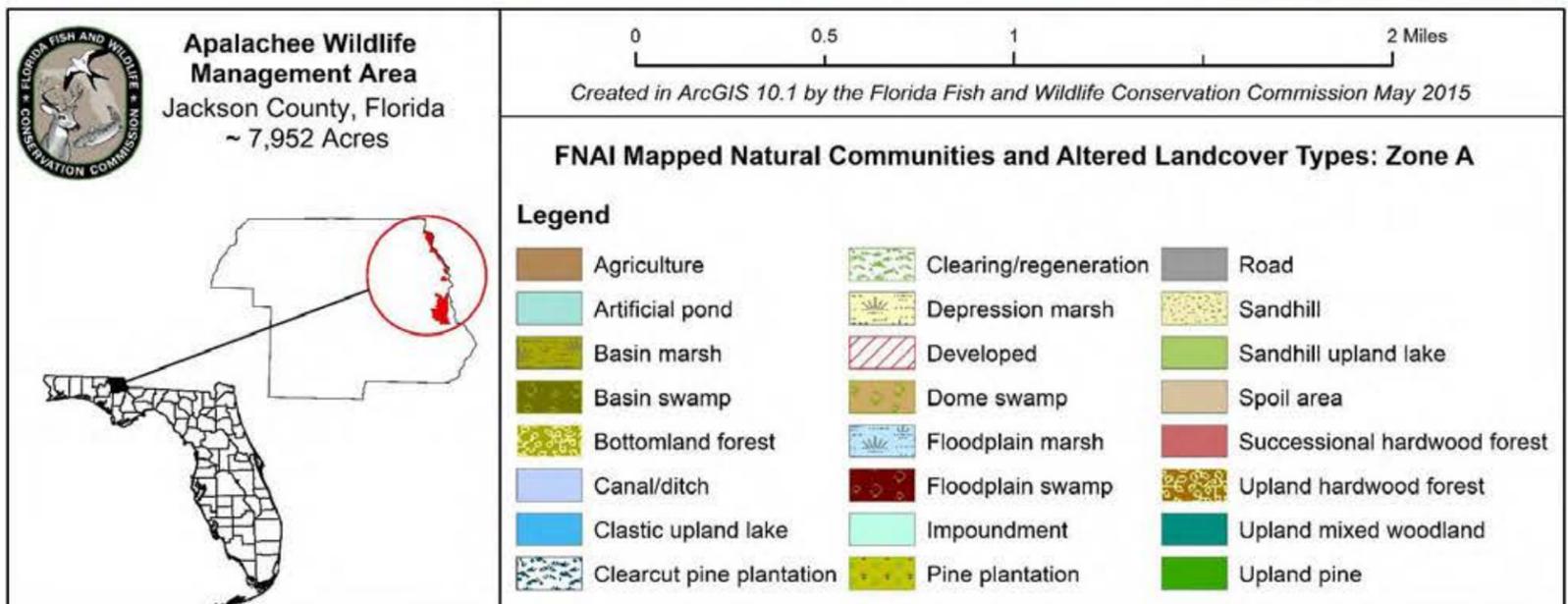
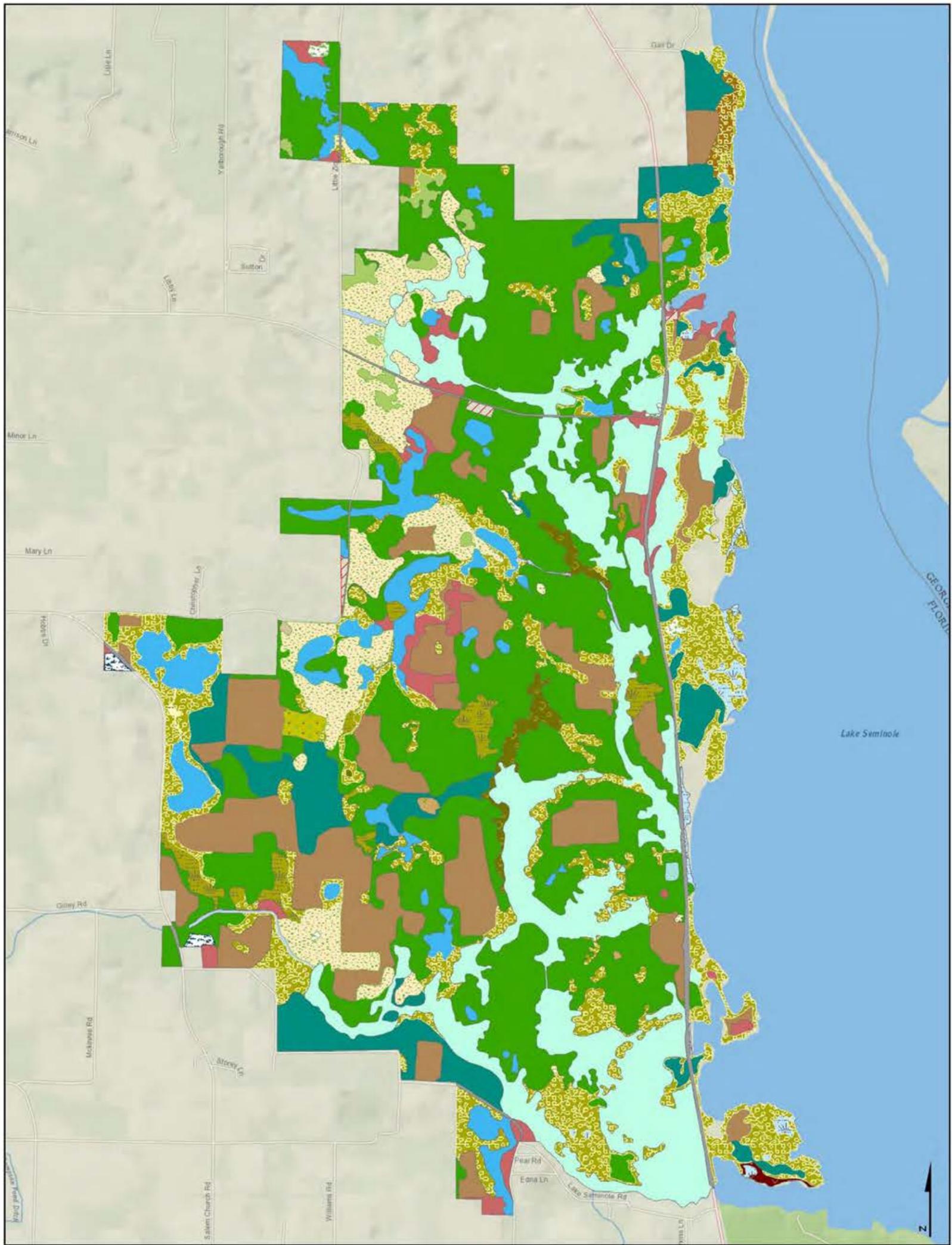


Figure 8. Natural Communities and Altered Landcover Types: Zone A
Florida Fish and Wildlife Conservation Commission | Apalachee WMA Management Plan

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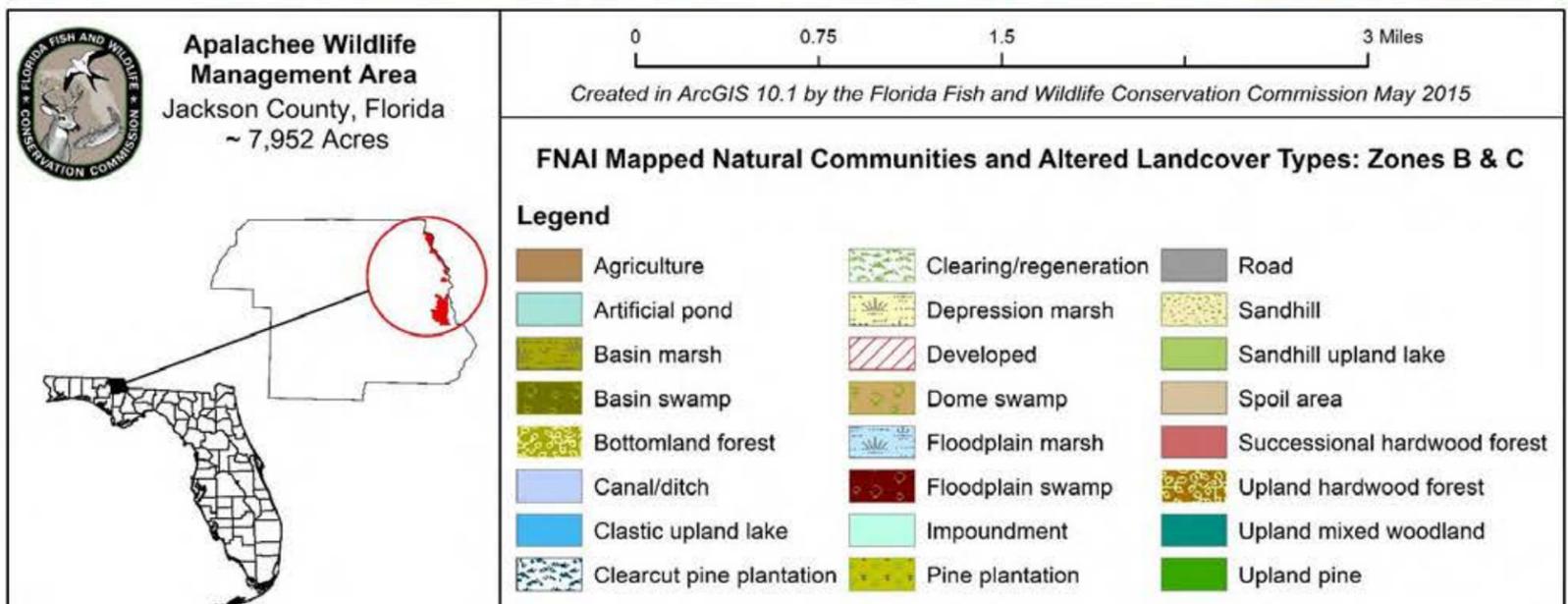
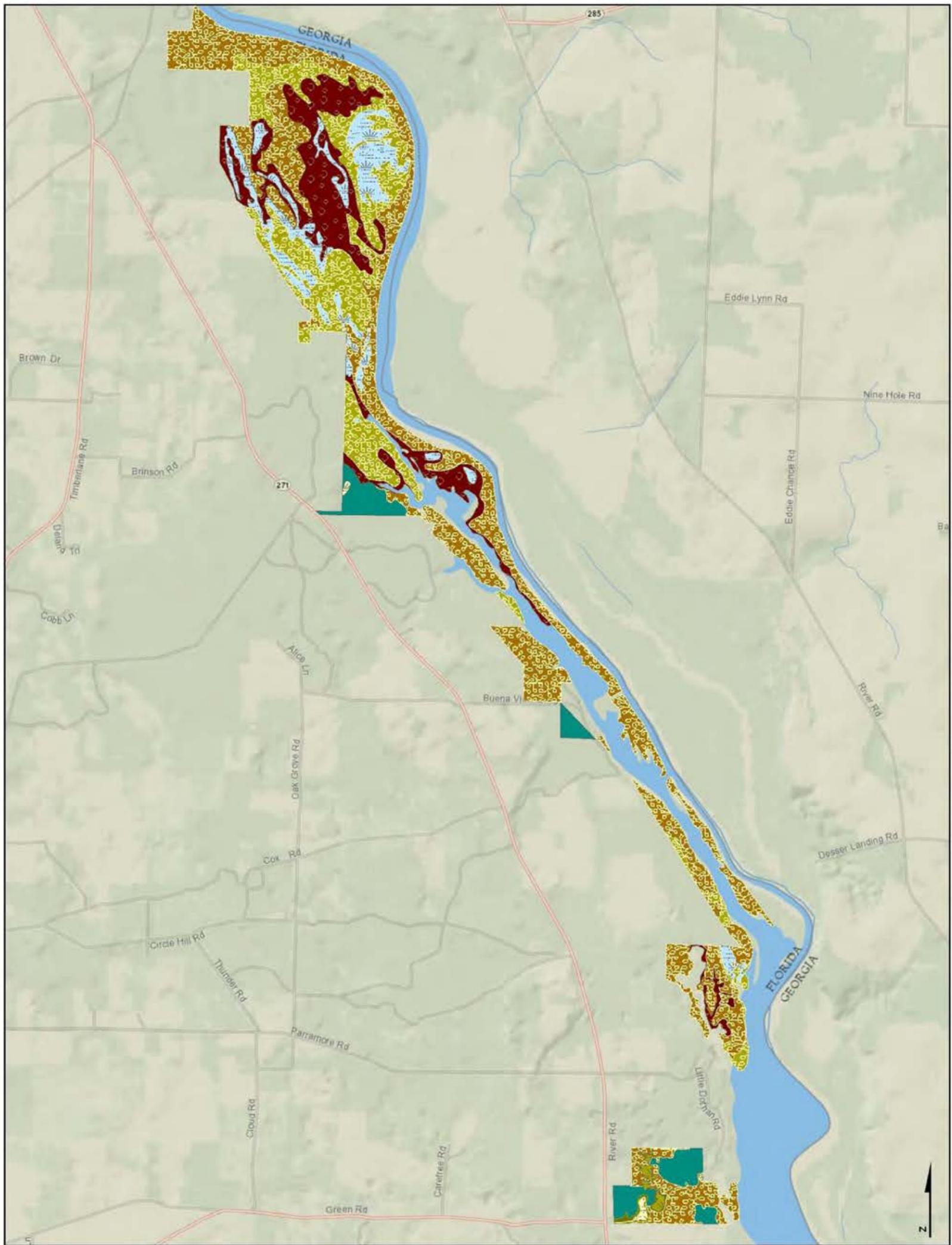


Figure 9. Natural Communities and Altered Landcover Types: Zones B & C

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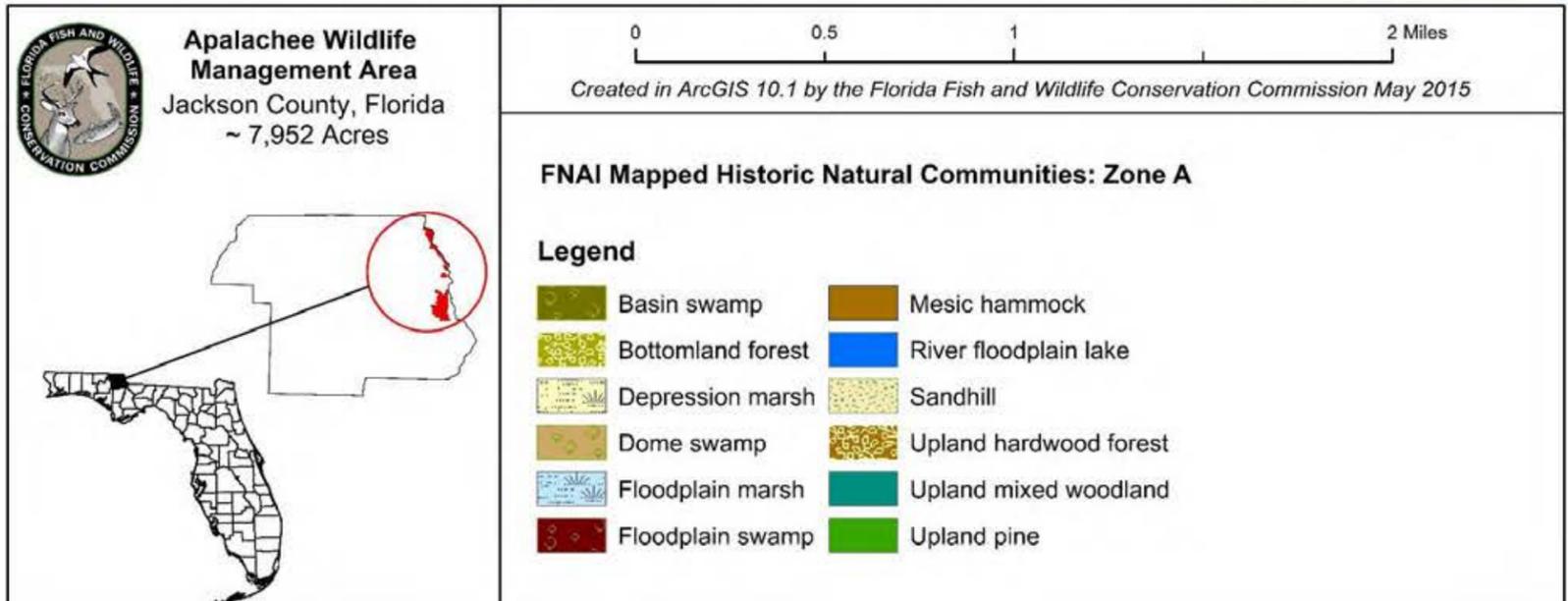
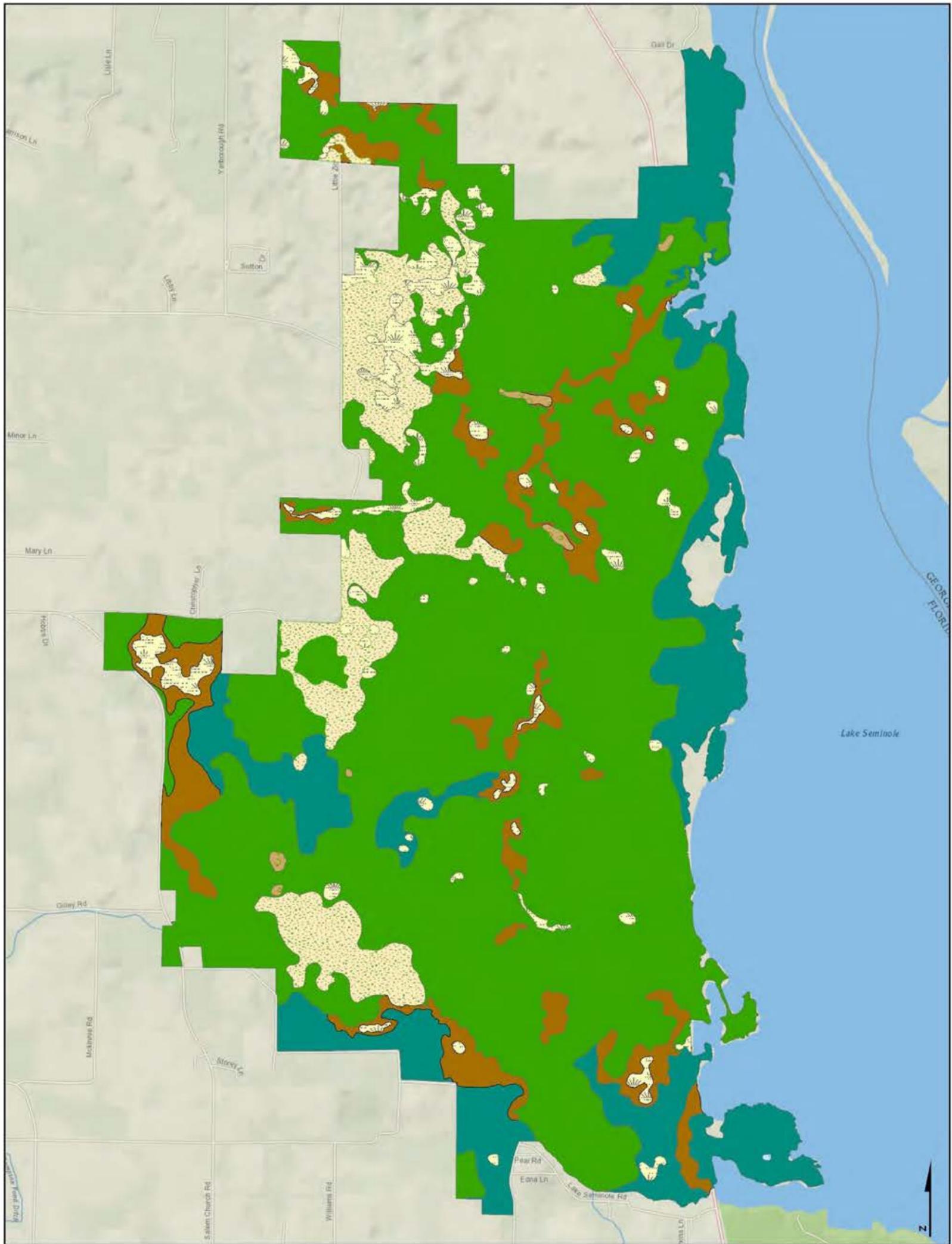


Figure 10. Historic Natural Communities: Zone A
Florida Fish and Wildlife Conservation Commission | Apalachee WMA Management Plan

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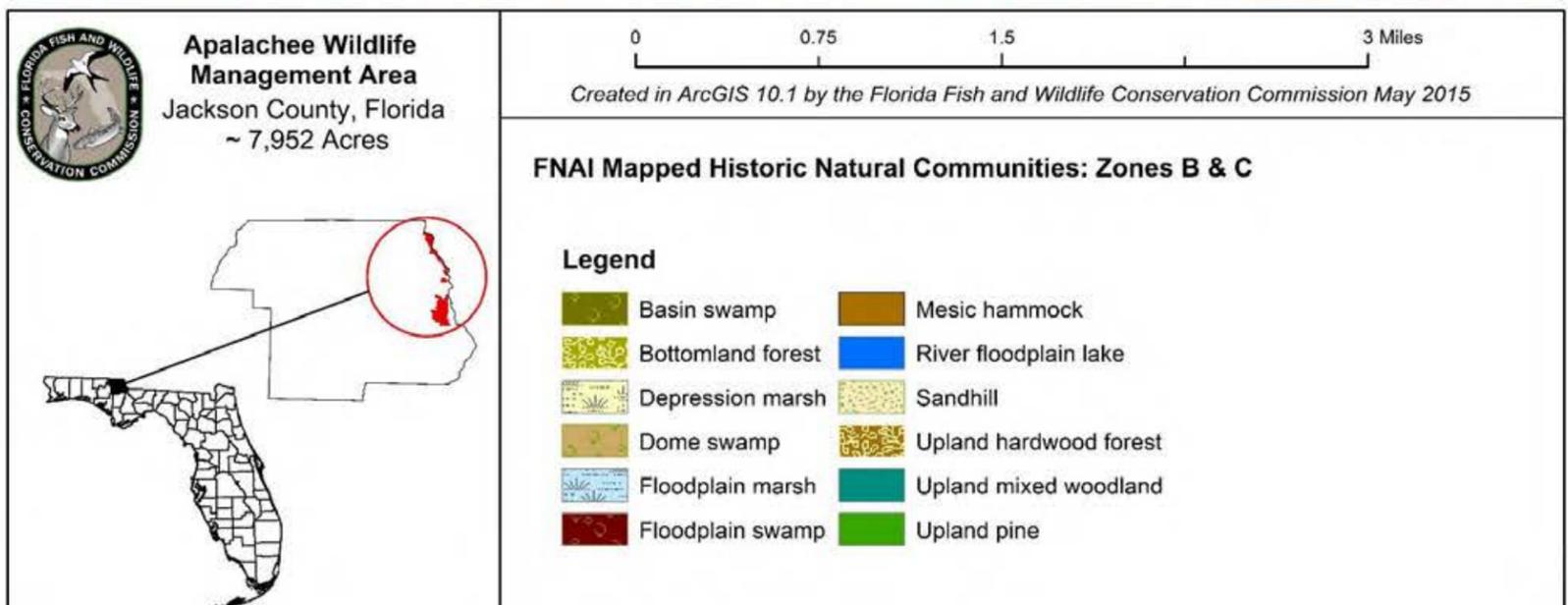
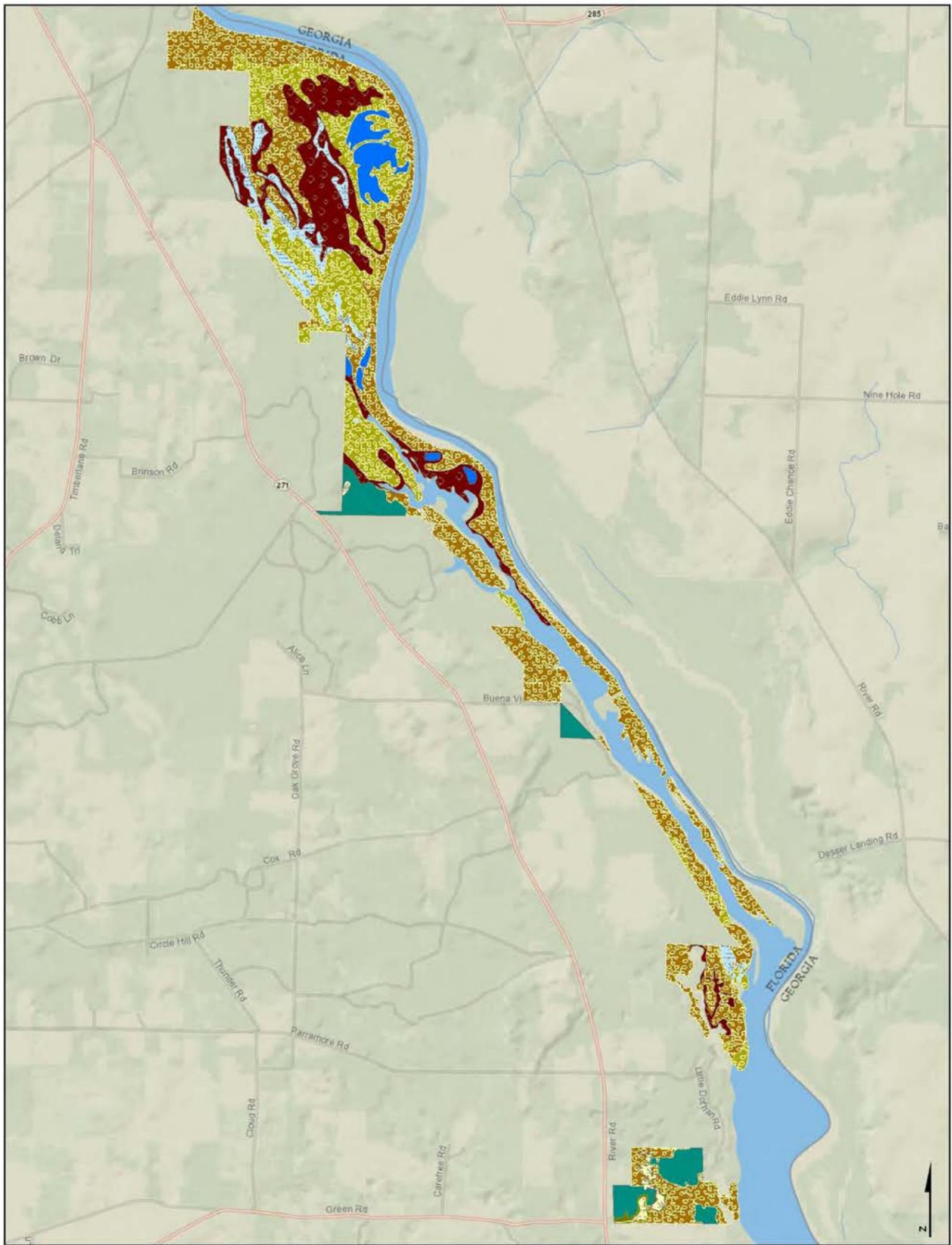


Figure 11. Historic Natural Communities Map: Zones B & C

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At AWMA, bottomland forest occurs on low-lying flatlands bordering streams, drainage ways, and low areas adjacent to Lake Seminole impoundments. This community is typically inundated only during extreme floods or as a result of exceptionally heavy rains. Bottomland forest has a closed canopy of tall, mature, and straight trees, including both pines and hardwoods, with a subcanopy of younger canopy species. The canopy is dense and closed, except during winter in areas where deciduous trees predominate. Air movement and light penetration are generally low, which promotes higher humidity levels and discourages the spread of fire. The understory may range from dense and shrubby with little groundcover, to one where the cover of ferns, herbs, and grasses is moderate to dense and shrubs are sparse. A higher water table associated with the creation of Lake Seminole accounts for the fact that this community occupies a greater overall area than it did historically. Bottomland forests at AWMA are somewhat artificial because they are often occupying areas that were once uplands. Bottomland forest at AWMA is also included within, or grades into, upland pine and, to a lesser extent, basin marsh, clastic upland lake, mesic hammock, and upland mixed woodland.

Typical bottomland canopy trees are red maple, sweetgum, swamp tupelo, loblolly pine, laurel oak, and water oak. These species may also occur in the subcanopy with flowering dogwood, common persimmon, and southern magnolia. Bottomland forest shrubs include American beautyberry, common buttonbush, common persimmon, sweetgum, wax myrtle, oaks, elderberry, and Elliott's blueberry. Herb density and diversity is variable and may include false nettle, sedges, spikerush, water horehound, cinnamon fern, royal fern, narrowfruit horned beaksedge, lizard's tail, marsh fern, netted chain fern, Virginia chain fern, and rainlily. Epiphytes such as resurrection fern and Spanish moss are often quite common in bottomland forests. Vines are also common and may include peppervine, rattan vine, crossvine, American buckwheatvine, trumpet creeper, yellow jessamine, Virginia creeper, greenbrier, eastern poison ivy, and muscadine.

Clastic upland lake (282.5 acres)

Clastic upland lakes are shallow to relatively deep, irregular-shaped depressions or basins occurring in uplands on clay substrates. These are lentic water bodies with surface inflows but often without significant outflows. Water is generally dissipated through evaporation and transpiration, but it may also disappear, especially during prolonged droughts, through sinks that connect with the aquifer.

At AWMA, clastic upland lakes are isolated and are not connected through natural or man-made drainage ways to the larger Lake Seminole impoundment. Historic mapping of AWMA, based on 1940 aerial imagery, indicates six examples of this community existed prior to the creation of Lake Seminole in the 1950s. Damming of the Apalachicola River raised the water table, resulting in significantly more, and larger, examples of this community. Presently, 43 clastic upland lakes are identified within the managed area.

Some clastic upland lakes have standing live oak snags – trees that were alive when groundwater seepage from Lake Seminole inundated low areas away from the impoundments' predicted flood zone. Today, some of these trees serve as nesting platforms for osprey. Clastic upland lakes may include, or be included within, basin marsh, bottomland forest or ruderal canals/ditches. Adjacent communities include basin marsh, bottomland forest, mesic hammock, sandhill, upland pine, and pine plantation. Clastic upland lakes are more common at AWMA than are sandhill upland lakes, which are almost completely surrounded by sandhill habitat.

The vegetation is concentrated around the edges of the open water and is similar to that of a basin marsh, including immersed and emergent herbs and, in shallow water, hydrophytic shrubs. Woody plants sometimes dominate portions of the water's edge and may range from small shrubs to large shrubs or, occasionally, even small trees. These may include red maple, common buttonbush, crimson-eyed rosemallow, myrtle dahoon, sweetgum, wax myrtle, swamp tupelo, and black willow. Shrubs give way to, or are replaced entirely by, emergent and/or floating herbs such as broomsedge bluestem, lemon bacopa, spadeleaf, spikerush, yellow pondlily, American white waterlily, royal fern, maidencane, marsh mermaidweed, lizard's tail, and yellow-eyed grass.

Depression marsh (13.0 acres)

Depression marsh, an herbaceous wetland community found in low flatlands, forms the characteristic pockmarked landscape seen on aerial photographs of the flat landscapes of the Florida peninsula. Depression marsh is usually characterized as a shallow, rounded depression in sand substrate with herbaceous vegetation and shrubs, often in concentric bands occurring within pyrogenic upland communities. These marshes also frequently form an outer rim around swamp communities such as dome swamps. They form when the overlying sands slump into depressions dissolved in underlying limestone. Depression marshes often burn with the surrounding landscape, and are seasonally inundated. Depression marshes typically occur in landscapes occupied by fire-maintained natural communities such as mesic flatwoods, dry prairie, or sandhill.

At AWMA, most examples of this community are deep and have a lengthy hydroperiod, allowing floating herbs such as American white waterlily to thrive. Nearly all are evident in historic aerial images, at least as seasonally inundated features. Flood tolerant and hydrophytic trees and shrubs are encroaching upon some depression marshes at AWMA, particularly those isolated within bottomland forests where fire is presently not a significant factor.

While there is usually an abundance of herbs, species diversity within depression marshes is limited. Typical species are lemon bacopa, spikerush, dog fennel, American white waterlily, royal fern, maidencane, combleaf mermaidweed, beaksedge, plume grass, lizard's

tail, marsh fern, Virginia chain fern, and yelloweyed grass. Canopy and subcanopy trees, when present, may include red maple, sweetgum, swamp tupelo, longleaf pine, and laurel oak. Shrubs species include hazel alder, common buttonbush, common persimmon, myrtle dahoon, wax myrtle, and black willow, and elderberry.

Dome swamp (5.7 acres)

Dome swamp is an isolated, forested depression wetland occurring within a fire-maintained community. Dome swamps often experience considerable variation in water levels and most are relatively shallow. Smaller trees typically grow in shallower waters along the swamps' outer edge, with taller, older, and more established trees growing in deeper water toward the interior. Some dome swamps have marsh vegetation or a small pond in their center, creating a “doughnut” appearance when viewed from above.

At AWMA, dome swamp is commonly referred to as gum ponds dominated by swamp tupelo instead of pond cypress. An underlying clay lens results in a longer hydroperiod and a longer fire return interval than the more typical cypress-dominated dome swamps occurring within sandy substrate.

A single example of dome swamp occurs at AWMA. The canopy and subcanopy is dominated by swamp tupelo but also includes laurel oak and water oak. Typical shrubs are red maple, common buttonbush, and sweetgum. The dome swamp observed had deep water, no herbaceous species, and coral greenbrier along the edges.

Floodplain marsh (268.8 acres)

Floodplain marshes are herbaceous or shrubby wetlands within the floodplain of streams and rivers and are maintained by varying fire and water regimes. The highest part of the marsh is often a drier, wet prairie-like zone with a large diversity of graminoids and forbs. Broadleaf emergents and floating plants occupy the deepest and most frequently flooded portions of the community. While the progression from high to low marsh occurs generally from the upland edge to the river edge, these vegetation patches may also be scattered throughout the marsh, which provides a diversity of habitats beneficial to wildlife. Other than occasional thickets, woody vegetation is generally sparse, although some shrubby species may be present. Occasionally, flood tolerant trees may be found scattered in floodplain marsh, becoming more concentrated in the ecotone to adjacent hydric hammocks. Most floodplain marshes are freshwater (salinity less than 0.5 parts per thousand); however, saltwater may influence marshes near the mouths of rivers (freshwater tidal marsh variant) and in areas where there is upwelling groundwater that is partly saline.

Extensive floodplain marshes make up a considerable percentage of the eastern areas of AWMA, adjacent to the Chattahoochee River. These marshes are large linear expanses of common buttonbush, coastalplain willow, bald cypress, lizard's tail, southern cattail,

Virginia chain fern, American white waterlily, American lotus, maidencane, pickerelweed, broadleaf cattail, netted chain fern, and giant cutgrass.

Floodplain swamp (413.3 acres)

Floodplain swamp is primarily deciduous forest occurring along rivers and larger streams and composed of trees tolerant of prolonged flooding. It ranges from narrow strips of cypress along primary and secondary streams to expansive stands along large rivers to tidally influenced freshwater swamps near river mouths. Often, floodplain swamps immediately border the stream or river channel. In many cases, however, floodplain swamps are isolated from the main channel by riverbank levees and restricted to oxbows, overflow channels, old stream beds, and expansive flats commonly called backswamps. 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. Soils are variable mixtures of alluvial and organic materials, sometimes with layers of sand in the subsoil. Inundation is seasonal and usually prolonged, restricting the growth of most shrubs and herbs and leaving most of the ground surface open or thinly mantled with leaf litter.

At AWMA, the floodplain swamp canopy is dominated by bald cypress. The canopy and subcanopy is dominated by swamp tupelo but also includes laurel oak and water oak. Typical shrubs and trees are red maple, common buttonbush, and sweetgum.

River floodplain lake (historic natural community, not currently present)

River floodplain lake is an isolated body of water that exists within the floodplain of a river system. This community is not connected to the typical flow of the river and is only connected to the river channel during extreme flood stages. This natural community forms in closed oxbow of the river. River floodplain lakes also have an ecotone of floodplain marsh dominated by graminoids and floating aquatic bed plants.

Sandhill (326.5 acres)

Sandhill occurs on rolling hills with deep, often yellowish, well-drained sands. These are open, xeric communities dominated by widely spaced longleaf pine trees with a sparse midstory of deciduous oaks and a moderate to dense groundcover of grasses, herbs, and low shrubs. The midstory trees and low shrubs can be sparse to dense, depending on fire history, and typically include turkey oak, bluejack oak, sand live oak, sand post oak, sparkleberry, dwarf huckleberry, pricklypear, and gopher apple. The diverse herbaceous groundcover is often dominated by wiregrass, with other grasses and herbs including pineywoods dropseed, lopsided Indiangrass, and a variety of forbs with many species of legumes and asters.

On AWMA, sandhill is naturally restricted to the western half of the area where it occurs on sandy slopes of gently rolling hills. Widely spaced pine trees with a sparse understory of

deciduous oaks and a fairly dense ground cover of grasses and herbs characterize this fire-dependent community type. The most typical sandhill association is longleaf pine, turkey oak, and wiregrass. The subcanopy is variable in terms of density and species richness, depending in part on the moisture regime of adjoining communities, past management practices, and alterations in natural hydrology associated with Lake Seminole. In some areas there is a rather abrupt change from sandhill vegetation to hydrophytic shrubs and herbs bordering sandhill upland lakes.

The area currently mapped as sandhill at AWMA is slightly reduced in size from the historic acreage. Some sandhill, especially in low-lying areas, was impacted by hydrologic alterations and higher groundwater levels associated with Lake Seminole. Hardwood species usually associated with more mesic habitats, such as black cherry, laurel oak, and water oak, are sometimes able to gain a toehold in sandhill as a result. Bottomland forest, mesic hammock, sandhill upland lake, and agricultural fields now occupy some former sandhill habitat. Currently mapped areas of sandhill also grade to upland pine forest.



Pines at AWMA, FWC

Primary canopy species are longleaf pine, turkey oak, and sand post oak. Within the subcanopy are southern crabapple, longleaf pine, loblolly pine, black cherry, southern red oak, laurel oak, bluejack oak, turkey oak, sand post oak, water oak, post oak, and live oak. Shrubs may include slimleaf pawpaw, littleleaf buckbrush, common persimmon, dwarf huckleberry, gopher apple, southern crabapple, black cherry, southern red oak, bluejack oak, turkey oak, sand post oak, blackjack oak, post oak, live oak, winged sumac, sassafras, sparkleberry, Darrow's blueberry, and shiny blueberry. Herbaceous plants in sandhill include incised groove-bur, Elliott's bluestem, splitbeard bluestem, broomsedge bluestem, chalky bluestem, wiregrass, partridge pea, goldenaster, tread softly, silver croton, summer farewell, ticktrefoil, witchgrasses, oblongleaf twinflower, dogtongue wild buckwheat, yankeeweed, roundhead lespedeza, pricklypear, Florida phlox, narrowleaf silkgrass, tall jointweed, bracken fern, dollarleaf, sweet goldenrod, lopsided Indiangrass, and sidebeak pencil flower. Vines are not a significant component in sandhill but may include earleaf greenbrier, eastern poison ivy, eastern poison oak, and muscadine.

Sandhill upland lake (38.4 acres)

Sandhill upland lakes are shallow, rounded, solution depressions occurring within sandy upland communities. These are generally permanent water bodies, although water levels may fluctuate substantially, sometimes drying completely during extreme droughts. They

are typically lentic water bodies without significant surface inflows or outflows. Instead, water may be largely derived from lateral ground water seepage through the surrounding well-drained uplands and/or from artesian sources via connections with the underlying limestone aquifer.

At AWMA, there is often a rather abrupt change from sandhill vegetation to sandhill upland lake. Hydrophytic grasses and herbs extend in a narrow band along the shoreline, with broader swaths developing where there are shallow and gradually sloping shorelines. Prescribed burning in the adjacent sandhill community, and fluctuations in water levels, influence the development of extensive zones of hydrophytic shrubs. Sandhill upland lakes are primarily located in the northwestern corner of the management area. These lakes are isolated from one another and are not connected through natural or man-made drainageways to the larger Lake Seminole impoundment.

Shrub species present along the edges of sandhill upland lakes include St. John's-wort, myrtle dahoon, and wax myrtle. Submerged and floating aquatic herbs include coontail, American white waterlily. Other herbs are broomsedge bluestem, spadeleaf, Mohr's thoroughwort, rush, and plumegrass.

Upland hardwood forest (1,074.5 acres)

Upland hardwood forest occurs on rolling mesic hills, slopes above river floodplains, in smaller areas on the sides of sinkholes, and occasionally on rises within floodplains. Limestone or phosphatic rock may be near the surface. Soils are generally sandy clays or clayey sands with substantial organic and sometimes calcareous components. These soils have higher nutrient levels than the sandy soils prevalent in most of Florida. The moisture retention properties of clays and layers of leaf mulch conserve soil moisture and create decidedly mesic conditions. The dense canopy and multiple layers of midstory vegetation restrict air movement and light penetration, which maintains high relative humidity within the community.

At AWMA, this mesic community is commonly found adjacent to the Chattahoochee River and often contains rare and unique plant species. There is a diverse assemblage of evergreen and deciduous tree species in the canopy and midstory, complemented by shade-tolerant shrubs, and a sparse groundcover. Exposed limestone rock is fairly uncommon in community, but assemblages of calcium-loving plants in numerous areas of the upland hardwood forest indicate limestone near the soil surface. Soils in upland hardwood forests are generally sandy clays or clayey sands with substantial organic components and high nutrient levels. The moisture retention properties of clays and layers of leaf mulch help conserve soil moisture and create decidedly mesic conditions. The dense canopy and multiple layers of vegetation in the midstory restrict air movement and light penetration, which can also keep humidity levels high and relatively constant. These unique conditions within this community support several rare plant species.

Canopy species are Florida maple, mockernut hickory, sweetgum, loblolly pine, black cherry, southern red oak, laurel oak, swamp chestnut oak, and water oak. Subcanopy elements include pignut hickory, eastern redbud, white fringe tree, flowering dogwood, sweetgum, eastern hophornbeam, black cherry, white oak, southern red oak, water oak, black oak, live oak, basswood, and American elm. Shrub species include Florida maple, red buckeye, American beautyberry, sweet-shrub, eastern redbud, white fringe tree, hawthorn, oakleaf hydrangea, sweetgum, black cherry, white oak, water oak, American elm, and sparkleberry. Among the herbaceous species are spleenwort, sedges, woodoats, witchgrasses, woodsgrass, bracken fern, bloodroot, and woodland pinkroot. Epiphytic plants in this community include resurrection fern, and Spanish moss. Vining plants are common and typical species are crossvine, Florida yam, yellow jessamine, trumpet honeysuckle, Virginia creeper, earleaf greenbrier, saw greenbrier, lanceleaf greenbrier, eastern poison ivy, and muscadine.

Upland mixed woodland (519.3 acres)

Upland mixed woodland has an open to partially closed hardwood canopy composed primarily of southern red oak and mockernut hickory and intermixed with shortleaf and longleaf pines. This community has a dense ground layer of short shrubs and herbs. Unlike upland pine and sandhill, wiregrass is typically lacking in upland mixed woodland.

Soils in this community are generally richer and contain more clay than the sandy soils found across most of Florida. At AWMA, these lands are often considered prime agricultural areas. Some historic upland mixed woodland was, in fact, converted to farmland while other sections were lost to impoundments associated with the creation of Lake Seminole. Upland mixed woodland at AWMA occurs over several soil types, including some with limitations for agriculture. This may explain why some tracts of upland mixed woodland remain intact and why they were apparently never logged completely or cleared for farming. This community transitions to bottomland, floodplain marsh, mesic hammock, sandhill, upland hardwood forest, upland pine forest, and clastic upland lakes, as well as to impoundments linked to Lake Seminole.

Primary species in the canopy layer include southern red oak, longleaf pine, mockernut hickory, sand post oak, shortleaf pine, loblolly pine, and post oak. Within the subcanopy are mockernut hickory, flowering dogwood, longleaf pine, black cherry, southern red oak, laurel oak, sand post oak, post oak, and live oak. Many of the same species occur as shrubs, including American beautyberry, littlehip hawthorn, common persimmon, wax myrtle, winged sumac, sassafras, sparkleberry, and Elliott's blueberry. The diverse herb layer includes Elliott's bluestem, splitbeard bluestem, broomsedge bluestem, chalky bluestem, tread softly, oblongleaf twinflower, dogtongue wild buckwheat, sensitive briar, narrowleaf silkgrass, bracken fern, Gray's beaksedge, sweet goldenrod, lopsided Indiangrass, squarehead, and some wiregrass. The federally endangered species, gentian pinkroot, occurs within upland mixed woodland at AWMA. Vines are usually present in upland

mixed woodland and species include yellow jessamine, Virginia creeper, greenbrier, eastern poison oak, eastern poison ivy, and muscadine.

Upland pine (1,743.9 acres)

Upland pine is characterized as a rolling forest of widely spaced canopy pines over a dense ground cover of grasses and herbs but few understory shrubs. The canopy is dominated by a mixed age class of longleaf pine but also includes other species of pine, various oaks and other hardwoods. Subcanopy and shrub species are generally sparse and low enough to allow ample light to penetrate the forest floor and promote a dense herbaceous ground cover, with a dominance of wiregrass. Areas with denser shrub and midstory strata suggest past fire exclusion.

Upland pine is the most widespread and common natural community at AWMA and it comprises some of the highest quality natural areas. Upland pine is a fire-dependent community, and current management practices are supporting numerous rare plants and animals. Upland pine at AWMA occurs on numerous soil types. The primary type is Hornsville fine sandy loam, a moderately well drained soil on terraces and uplands that is often considered prime farmland. Upland pine historically occupied a larger portion of the managed area but agricultural fields and impoundments linked to the creation of Lake Seminole have reduced its total acreage. Upland pine also transitions to basin marsh, bottomland forest, upland mixed woodland, and clastic upland lakes.

The canopy of longleaf pine is intermixed with small amounts of mockernut hickory, shortleaf pine, loblolly pine, black cherry, southern red oak, laurel oak, sand post oak, water oak, post oak, and live oak. Many of these same species co-occur within the subcanopy layer as do flowering dogwood, common persimmon, and sassafras. Shrubs may include slimleaf pawpaw, American beautyberry, littleleaf buckbrush, littlehip hawthorn, common persimmon, dwarf huckleberry, blue huckleberry, gopher apple, southern crabapple, wax myrtle, black cherry, oaks, winged sumac, sassafras, sparkleberry, Darrow's blueberry, Elliott's blueberry, shiny blueberry, and deerberry. Among the many herbs present are wiregrass, bluestems, Virginia snakeroot, butterflyweed, white wild indigo, soft greeneyes, partridge pea, tread softly, rabbitbells, silver croton, summer farewell, oblongleaf twinflower, dogtongue wild buckwheat, button rattlesnakemaster, roundhead lespedeza, slender lespedeza, sensitive briar, beaked panicum, switchgrass, narrowleaf silkgrass, bracken fern, little bluestem, slender bluestem, sweet goldenrod, Apalachicola Indiangrass, lopsided Indiangrass, scaleleaf aster, and squarehead. Vines are not infrequent and include yellow jessamine, Virginia creeper, earleaf greenbrier, saw greenbrier, cat greenbrier, roundleaf greenbrier, lanceleaf greenbrier, bristly greenbrier, eastern poison oak, eastern poison ivy, and muscadine.

Altered Landcover Descriptions

Agriculture

The FNAI classifies altered communities as agriculture when they include row crops, citrus groves, and sod fields that are generally being maintained to grow products for human or domesticated animal use.

Agricultural fields represent a large percentage of ruderal lands at AWMA and these include a mix of active and fallow agricultural fields and wildlife food plots. Many of the existing fields have been in cultivation since at least 1940. There are 525 acres of dedicated agricultural fields at AWMA. There are 700.6 acres mapped as agriculture at AWMA.



Field at AWMA, *David Moynahan*

Artificial pond

Artificial ponds are water retention ponds, cattle ponds, etc. A small, 2.8-acre artificial pond is located west of River Road on Zone A.

Canal/ditch

Areas classified as canal/ditch are artificial linear drainage ways. There are 11.4 acres of canal/ditch at AWMA. The FWC maintains 1.3 miles of canal/ditch for connection to area waterbodies and for use by small watercraft.

Clearcut pine plantation

Areas of pine plantation that have undergone clearcutting of the pine canopy but have not yet been replanted with pine trees. These areas are often dominated by weedy native and non-native species. Natural pine dominated communities that have been clearcut but not further altered should be classified as the natural community. There are 7.3 acres classified as clearcut pine plantation at AWMA located on Zone A.

Clearing/regeneration

Clearing/regeneration areas are dove fields, wildlife food plots, recent or historic clearings that have significantly altered the groundcover and/or overstory of the original natural community (old homesites, etc.). There are 8.4 acres mapped at clearing/regeneration at AWMA.

Developed

Developed areas include check stations, off road vehicle use areas, parking lots, buildings, maintained lawns, botanical or ornamental gardens, campgrounds, recreational, industrial,

and residential areas. At AWMA, developed areas include the AWMA office and workshop compound, the area manager's residence, and an area of driveway connections along the western boundary. There are 7.3 developed acres at AWMA.

Impoundment

Impoundments are stream or other watershed impoundment. Areas classified as impoundment at AWMA are connected with Lake Seminole and occur on Zone A. Impoundments cover 859.6 acres and are the largest altered landcover type at AWMA.

Pine plantation

Pine plantation refers to those areas with a dominant cover of even-aged pines and a shrubby or vine-dominated understory with deep pine needle duff. The overstory structure of pine plantations is such that it compromises the integrity of the ground layer and, specifically, the herbaceous vegetation. The vegetation is typical of the surrounding plant communities and may include weedy, early successional, and/or non-native species. Where some native groundcover exists, management practices such as thinning and burning may set the course for additional restoration activities.

On AWMA, the small areas that are identified as pine plantations occur on former agricultural fields. Loblolly pine is the most common canopy species in the pine plantations on AWMA but other trees such as longleaf pine, black cherry, laurel oak, and live oak are sometimes present as well. The subcanopy is typically sparse or is poorly defined and may include flowering dogwood, sweetgum, loblolly pine, southern red oak, water oak, and black cherry. Taller shrubs are less common than shorter shrubs, especially where management practices involve regular burning. Commonly encountered species include American beautyberry, common persimmon, sweetgum, wax myrtle, various oaks, winged sumac, sand blackberry, and sassafras. Herbs are variable both in terms of density and in species diversity. Frequent elements include common ragweed, broomsedge bluestem, silver croton, sedges, partridge pea, witchgrasses, tall elephantsfoot, slender flattop goldenrod, hairy bedstraw, narrowleaf silkgrass, goldenrod, and coastalplain dawnflower. Vines are not uncommon but are kept in check by prescribed burning. Examples include peppervine, yellow jessamine, eastern poison oak, and muscadine. There are 12.6 acres of pine plantation mapped at AWMA.

Road

Roads are paved and unpaved publically accessible roadways that bisect managed areas and are classified as ruderal. There are a variety of roads at AWMA with varying levels of accessibility for the public. There are 14.5 miles of roads accessible to motorized vehicles and over 12 miles of access roads used by area staff and open to hiking, bicycling, and horseback riding.

Spoil area

Spoil areas are sites where dredge or spoil material is deposited. These areas may or may not be re-colonized by vegetation. The spoil are at AWMA comprises 1.2 acres on Zone A.

Successional hardwood forest

Successional hardwood forests are closed-canopied forest dominated by fast growing hardwoods such as laurel oak, water oak, and/or sweetgum, often with remnant pines. These forests are either invaded natural habitat (i.e., mesic flatwoods, sandhill, upland pine, upland mixed woodland) due to lengthy fire-suppression or old fields that have succeeded to forest. The subcanopy and shrub layers of these forests are often dense and dominated by smaller individuals of the canopy species. Remnant species of the former natural community may also be present.

Successional hardwood forests at AWMA have invaded or replaced other natural communities, primarily upland pine, often as a result of lengthy fire exclusion. Presently, successional hardwood forests occur along agricultural fields and roadways, and in naturally fire-protected areas adjoining, or surrounded by, the Lake Seminole impoundment.

Canopy trees are dominated by a dense canopy of laurel oak, water oak, and sweetgum. Other species present in the canopy include mockernut hickory, red cedar, longleaf pine, loblolly pine, black cherry, southern red oak, and live oak. These species may also occur in the subcanopy with flowering dogwood and swamp tupelo. Typical shrubs are American beautyberry, common persimmon, sweetgum, wax myrtle, black cherry, laurel oak, water oak, sassafras, sparkleberry, highbush blueberry, Elliott's blueberry, and deerberry. The often dense woody plant overstory limits the diversity of herbs, which may include ebony spleenwort, witchgrass, elephantsfoot, woodsgrass, goldenrod, and netted chain fern. These conditions favor epiphytes such as resurrection fern and Spanish moss. Vines may be plentiful and may include yellow jessamine, trumpet honeysuckle, Virginia creeper, earleaf greenbrier, saw greenbrier, cat greenbrier, lanceleaf greenbrier, eastern poison ivy, and muscadine. There are 113 acres of successional hardwood forest at AWMA.

2.2.2 Forest Resources

Forest resources on AWMA include pines and hardwoods within the area's upland pine, bottomland forest, upland hardwood forest, upland mixed woodland, floodplain swamp, and sandhill communities. As described above, the ACOE has reserved the timber rights on the area and therefore, has lead management authority on timber resource management and harvesting. A Timber Assessment may be prepared by the ACOE or a contracted private professional forestry consultant. Also, a comprehensive timber inventory of the timber resources of the AWMA, including a timber cruise and a forest inventory report with tree measurements, radial growth plots, stand and stock tables, and statistical analyses, may be completed. If determined to be necessary, the FWC will cooperate with the ACOE to develop a Forest Resource Management Plan.

2.3 Fish and Wildlife Resources

The AWMA has a diverse assortment of fish and wildlife species (Tables 7-11). The FWC also maintains a list of exotic fauna documented or expected to occur at AWMA (Table 12). There are 10 imperiled or protected animal species, also known as listed species, which have been documented or expected to occur within AWMA (Table 13). The area's unique location along the shores of the Chattahoochee River and Lake Seminole provides a diversity of habitat for resident and migratory birds (Table 8). The area's diverse mixture of upland pines, bottomland forests, hardwood forests, and water resources provide a mosaic of habitat for wildlife.

Table 7. Mammals Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Beaver	<i>Castor canadensis</i>
Big brown bat	<i>Eptesicus fuscus</i>
Bobcat	<i>Lynx rufus</i>
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Coyote	<i>Canis latrans</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern fox squirrel	<i>Sciurus niger niger</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Eastern mole	<i>Scalopus aquaticus</i>
Eastern woodrat	<i>Neotoma floridana</i>
Evening bat	<i>Nycticeius humeralis</i>
Golden mouse	<i>Ochrotomys nuttalli</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Hoary bat	<i>Lasiurus cinereus</i>
Least shrew	<i>Cryptotis parva</i>
Little brown bat	<i>Myotis lucifugus</i>
Marsh rabbit	<i>Sylvilagus palustris</i>
Nine-banded armadillo	<i>Dasyus novemcinctus</i>
Northern yellow bat	<i>Lasiurus intermedius</i>
Oldfield mouse	<i>Peromyscus polionotus</i>
Opossum	<i>Didelphis virginiana</i>
Pine vole	<i>Microtus pinetorum</i>
Raccoon	<i>Procyon lotor</i>
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii rafinesquii</i>
Red bat	<i>Lasiurus borealis</i>
River otter	<i>Lontra canadensis</i>
Southeastern bat	<i>Myotis austroriparius</i>

Table 7. Mammals Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Southeastern pocket gopher	<i>Geomys pinetis</i>
Southern flying squirrel	<i>Glaucomys volans</i>
Southern short-tailed shrew	<i>Blarina carolinensis shermani</i>
Striped skunk	<i>Mephitis mephitis</i>
Tri-colored bat	<i>Perimyotis subflavus subflavus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Wild hog	<i>Sus scrofa</i>

Table 8. Birds Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Acadian flycatcher	<i>Empidonax vireescens</i>
American bittern	<i>Botaurus lentiginosus</i>
American coot	<i>Fulica americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American goldfinch	<i>Carduelis tristis</i>
American kestrel	<i>Falco sparverius</i>
American redstart	<i>Setophaga ruticilla</i>
American robin	<i>Turdus migratorius</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
American wigeon	<i>Anas americana</i>
American woodcock	<i>Scolopax minor</i>
Anhinga	<i>Anhinga anhinga</i>
Bachman's sparrow	<i>Peucaea aestivalis</i>
Bank swallow	<i>Riparia riparia</i>
Barn owl	<i>Tyto alba</i>
Barn swallow	<i>Hirundo rustica</i>
Barred owl	<i>Strix varia</i>
Belted kingfisher	<i>Megaceryle alcyon</i>
Black vulture	<i>Coragyps atratus</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Black-bellied whistling duck	<i>Dendrocygna autumnalis</i>
Black-crowned night heron	<i>Nycticorax nycticorax</i>
Black-throated blue warbler	<i>Setophaga caerulescens</i>
Blue grosbeak	<i>Passerina caerulea</i>
Blue jay	<i>Cyanocitta cristata</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Blue-winged teal	<i>Anas discors</i>
Boat-tailed grackle	<i>Quiscalus major</i>

Table 8. Birds Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Bobolink	<i>Dolichonyx oryzivorus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Bufflehead	<i>Bucephala albeola</i>
Canada goose	<i>Branta canadensis</i>
Canvasback	<i>Aythya valisineria</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Cattle egret	<i>Bubulcus ibis</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Chimney swift	<i>Chaetura pelagica</i>
Chipping sparrow	<i>Spizella passerine</i>
Chuck-will's widow	<i>Caprimulgus carolinensis</i>
Common grackle	<i>Quiscalus quiscula</i>
Common ground-dove	<i>Columbina passerina</i>
Common moorhen	<i>Gallinula chloropus</i>
Common nighthawk	<i>Chordeiles minor</i>
Common snipe	<i>Gallinago gallinago</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Coopers hawk	<i>Accipiter cooperii</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Eastern bluebird	<i>Sialia sialis</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Eastern meadowlark	<i>Sturnella magna</i>
Eastern phoebe	<i>Sayornis phoebe</i>
Eastern screech owl	<i>Megascops asio</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
Eastern wood-pewee	<i>Contopus virens</i>
Eurasian collared-dove	<i>Streptopelia decaocto</i>
Field sparrow	<i>Spizella pusilla</i>
Fish crow	<i>Corvus ossifragus</i>
Gadwall	<i>Anas strepera</i>
Glossy ibis	<i>Plegadis falcinellus</i>
Gray catbird	<i>Dumetella carolinensis</i>
Great blue heron	<i>Ardea herodias</i>
Great crested flycatcher	<i>Myiarchus crinitus</i>
Great egret	<i>Ardea alba</i>

Table 8. Birds Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Great horned owl	<i>Bubo virginianus</i>
Green heron	<i>Butorides striata</i>
Green-winged teal	<i>Anas crecca</i>
Hairy woodpecker	<i>Picoides villosus</i>
Henslow's sparrow	<i>Ammodramus henslowii</i>
Hermit thrush	<i>Catharus guttata</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Hooded warbler	<i>Setophaga citrina</i>
House finch	<i>Carpodacus mexicanus</i>
House wren	<i>Troglodytes aedon</i>
Indigo bunting	<i>Passerina cyanea</i>
Kentucky warbler	<i>Geothlypis formosa</i>
Killdeer	<i>Charadrius vociferus</i>
King rail	<i>Rallus elegans</i>
Laughing gull	<i>Leucophaeus atricilla</i>
Least bittern	<i>Ixobrychus exilis</i>
Least sandpiper	<i>Calidris minutilla</i>
Lesser scaup	<i>Aythya affinis</i>
Little blue heron	<i>Egretta caerulea</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Louisiana waterthrush	<i>Parkesia motacilla</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh wren	<i>Cistothorus palustris</i>
Mississippi kite	<i>Ictinia mississippiensis</i>
Mourning dove	<i>Zenaida macroura</i>
Northern bobwhite	<i>Colinus virginianus</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Northern flicker	<i>Colaptes auratus</i>
Northern harrier	<i>Circus cyaneus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Northern parula	<i>Setophaga americana</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Northern shoveler	<i>Anas clypeata</i>
Northern waterthrush	<i>Parkesia noveboracensis</i>
Orange-crowned warbler	<i>Oreothlypis celata</i>
Orchard oriole	<i>Icterus spurius</i>
Osprey	<i>Pandion haliaetus</i>
Palm warbler	<i>Setophaga palmarum</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>

Table 8. Birds Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Pileated woodpecker	<i>Dryocopus pileatus</i>
Pine warbler	<i>Setophaga pinus</i>
Prairie warbler	<i>Setophaga discolor</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Purple gallinule	<i>Porphyrio martinica</i>
Purple martin	<i>Progne subis</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-breasted merganser	<i>Mergus serrator</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Redhead	<i>Aythya americana</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Ring-necked duck	<i>Aythya collaris</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Ruby-throated hummingbird	<i>Archilochus colubris</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Rusty blackbird	<i>Euphagus carolinus</i>
Sandhill crane	<i>Grus canadensis</i>
Scarlet tanager	<i>Piranga olivacea</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Snowy egret	<i>Egretta thula</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Solitary vireo	<i>Vireo solitarius</i>
Song sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
Southern bald eagle	<i>Haliaeetus leucocephalus</i>
Spotted sandpiper	<i>Actitis macularius</i>
Summer tanager	<i>Piranga rubra</i>
Swainson's warbler	<i>Limnothlypis swainsonii</i>
Swallow-tailed kite	<i>Elanoides forficatus</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Tree swallow	<i>Tachycineta bicolor</i>
Tricolor heron	<i>Egretta tricolor</i>
Tufted titmouse	<i>Baeolophus bicolor</i>
Turkey vulture	<i>Cathartes aura</i>
Veery	<i>Catharus fuscescens</i>

Table 8. Birds Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Whip-poor-will	<i>Caprimulgus vociferus</i>
White ibis	<i>Eudocimus albus</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
White-eyed vireo	<i>Vireo griseus</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Wild turkey	<i>Meleagris gallopavo</i>
Winter wren	<i>Troglodytes hiemalis</i>
Wood duck	<i>Aix sponsa</i>
Wood stork	<i>Mycteria americana</i>
Wood thrush	<i>Hylocichla mustelina</i>
Worm-eating warbler	<i>Helmitheros vermivorum</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Yellow-breasted chat	<i>Icteria virens</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>
Yellow-throated warbler	<i>Setophaga dominica</i>

Table 9. Amphibians Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Bird-voiced treefrog	<i>Hyla avivoca</i>
Bronze frog	<i>Lithobates clamitans clamitans</i>
Bull frog	<i>Lithobates catesbeianus</i>
Cricket frog	<i>Acris gryllus</i>
Dwarf salamander	<i>Eurycea quadridigitata</i>
Eastern newt	<i>Notophthalmus viridescens</i>
Eastern spadefoot toad	<i>Scaphiopus holbrookii</i>
Four-toed salamander	<i>Hemidactylium scutatum</i>
Greater siren	<i>Siren lacertina</i>
Green treefrog	<i>Hyla cinerea</i>
Lesser siren	<i>Siren intermedia</i>
Little grass frog	<i>Pseudacris ocularis</i>
Marbled salamander	<i>Ambystoma opacum</i>
Mole salamander	<i>Ambystoma talpoideum</i>
Mud salamander	<i>Pseudotriton montanus</i>
Narrow-mouthed frog	<i>Gastrophryne carolinensis</i>
Oak toad	<i>Anaxyrus quercicus</i>
Pig frog	<i>Lithobates grylio</i>

Table 9. Amphibians Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Pinewoods treefrog	<i>Hyla femoralis</i>
River frog	<i>Lithobates heckscheri</i>
Slimy salamander	<i>Plethodon glutinosus</i>
Southern leopard frog	<i>Lithobates sphenoccephalus utricularius</i>
Southern spring peeper	<i>Pseudacris crucifer</i>
Southern toad	<i>Anaxyrus terrestris</i>
Squirrel treefrog	<i>Hyla squirella</i>
Three-lined salamander	<i>Eurycea longicauda</i>
Two-lined salamander	<i>Eurycea bislineata</i>
Two-toed amphiuma	<i>Amphiuma means</i>

Table 10. Reptiles Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Alligator snapping turtle	<i>Macrochelys temminckii</i>
American alligator	<i>Alligator mississippiensis</i>
Banded water snake	<i>Nerodia fasciata</i>
Black racer	<i>Coluber constrictor</i>
Black swamp snake	<i>Seminatrix pygaea</i>
Broadhead skink	<i>Plestiodon laticeps</i>
Brown water snake	<i>Nerodia taxispilota</i>
Chicken turtle	<i>Deirochelys reticularia</i>
Coachwhip	<i>Masticophis flagellum</i>
Common snapping turtle	<i>Chelydra serpentina</i>
Corn snake	<i>Pantherophis guttatus</i>
Cottonmouth	<i>Agkistrodon piscivorus</i>
Dusky pigmy rattlesnake	<i>Sistrurus miliarius barbouri</i>
Eastern coral snake	<i>Micrurus fulvius</i>
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>
Eastern glass lizard	<i>Ophisaurus ventralis</i>
Eastern hog-nosed snake	<i>Heterodon platirhinos</i>
Eastern indigo snake	<i>Drymarchon couperi</i>
Eastern kingsnake	<i>Lampropeltis getula</i>
Eastern mud snake	<i>Farancia abacura</i>
Eastern mud turtle	<i>Kinosternon subrubrum</i>
Eastern ribbon snake	<i>Thamnophis sauritus sauritus</i>
Eastern six-lined racerunner	<i>Cnemidophorus sexlineatus</i>
Florida cooter	<i>Pseudemys concinna floridana</i>
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>
Florida softshell turtle	<i>Apalone ferox</i>

Table 10. Reptiles Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Florida water snake	<i>Nerodia fasciata pictiventris</i>
Garter snake	<i>Thamnophis sauritus</i>
Glossy crawfish water snake	<i>Regina rigida</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Gray rat snake	<i>Pantherophis spiloides</i>
Green anole	<i>Anolis carolinensis</i>
Green snake	<i>Opheodrys aestivus</i>
Greenhouse frog	<i>Eleutherodactylus planirostris</i>
Ground skink	<i>Scincella lateralis</i>
Gulf coast box turtle	<i>Terrapene carolina major</i>
Loggerhead musk turtle	<i>Sternotherus minor</i>
Mole skink	<i>Plestiodon egregius</i>
Redbelly water snake	<i>Nerodia erythrogaster erythrogaster</i>
Ringneck snake	<i>Diadophis punctatus</i>
Scarlet king snake	<i>Lampropeltis triangulum elapsoides</i>
Scarlet snake	<i>Cemophora coccinea</i>
Slider	<i>Trachemys scripta</i>
Smooth earth snake	<i>Virginia valeriae</i>
Southeastern five-lined skink	<i>Plestiodon inexpectatus</i>
Southern copperhead	<i>Agkistrodon contortix</i>
Southern fence lizard	<i>Sceloporus undulatus</i>
Stinkpot	<i>Sternotherus odoratus</i>

Table 11. Fish Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Banded pygmy sunfish	<i>Elassoma zonatum</i>
Bannerfin shiner	<i>Cyprinella leedsii</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blackbanded darter	<i>Percina nigrofasciata</i>
Blacktail shiner	<i>Cyprinella venustus</i>
Bluegill	<i>Lepomis macrochirus</i>
Bluespotted sunfish	<i>Enneacanthus gloriosus</i>
Bowfin	<i>Amia calva</i>
Brook silverside	<i>Labidesthes sicculus</i>
Brown bullhead	<i>Ameiurus nebulosus</i>
Chain pickerel	<i>Esox niger</i>
Channel catfish	<i>Ictalurus punctatus</i>
Clear chub	<i>Hybopsis winchelli</i>
Coastal shiner	<i>Notropis petersoni</i>

Table 11. Fish Documented or Expected to Occur at AWMA

Common Name	Scientific Name
Common carp	<i>Cyprinus carpio</i>
Dollar sunfish	<i>Lepomis marginatus</i>
Flathead catfish	<i>Pylopictis olivaris</i>
Flier	<i>Centrarchus macropterus</i>
Florida gar	<i>Lepisosteus platyrhincus</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Green sunfish	<i>Lepomis cyanellus</i>
Gulf darter	<i>Etheostoma swaini</i>
Lake chubsucker	<i>Erimyzon sucetta</i>
Largemouth bass	<i>Micropterus salmoides</i>
Least killifish	<i>Heterandria formosa</i>
Lined topminnow	<i>Fundulus tineolatus</i>
Longnose gar	<i>Lepisosteus osseus</i>
Mosquitofish	<i>Gambusia affinis</i>
Mud sunfish	<i>Acantharchus pomotis</i>
Pirate perch	<i>Aphredoderus sayanus</i>
Pugnose minnow	<i>Opsopoeodus emiliae</i>
Redbreast sunfish	<i>Lepomis auritus</i>
Redear sunfish	<i>Lepomis microlophus</i>
Redfin pickerel	<i>Esox americanus</i>
Southern brook lamprey	<i>Ichthyomyzon gagei</i>
Speckled madtom	<i>Noturus leptacanthus</i>
Spotted bullhead	<i>Ameiurus serracanthus</i>
Spotted sucker	<i>Minytrema melanops</i>
Spotted sunfish	<i>Lepomis punctatus</i>
Striped bass	<i>Morone saxatilis</i>
Swamp darter	<i>Etheostoma fusiforme</i>
Tadpole madtom	<i>Noturus gyrinus</i>
Taillight shiner	<i>Notropis maculatus</i>
Threadfin shad	<i>Dorosoma petenense</i>
Warmouth	<i>Lepomis gulosus</i>
Weed shiner	<i>Notropis texanus</i>
White bass	<i>Morone chrysops</i>
White catfish	<i>Ameiurus catus</i>
Yellow bullhead	<i>Ameiurus natalis</i>

Table 12. Exotic Animal Species Documented or Expected* to Occur at AWMA

Common Name	Scientific Name
Mammals	
Feral hog	<i>Sus scrofa</i>
Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Birds	
Cattle egret	<i>Bubulcus ibis</i>
Eurasian collared-dove*	<i>Streptopelia decaocto</i>
Amphibians	
Greenhouse frog*	<i>Eleutherodactylus planirostris</i>
Fish	
Common carp	<i>Cyprinus carpio</i>
Flathead catfish*	<i>Pylopictis olivaris</i>

* = expected to occur but not documented

2.3.1 Integrated Wildlife Habitat Ranking System

The FWC has developed the Integrated Wildlife Habitat Ranking System (IWHRS) as a GIS-based assessment tool that incorporates a wide variety of land cover and wildlife species data. The IWHRS evaluates the Florida landscape based upon the habitat needs of wildlife as a way to identify ecologically significant lands in the state, and to assess the potential impacts of management and land-use changes. The IWHRS was developed to provide technical assistance to various local, regional, state, and federal agencies, and entities interested in wildlife needs and conservation in order 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 IWHRS (2009) indicates that AWMA has a mean wildlife value of 5.0 (Figure 12).



Gopher tortoise at AWMA, FWC

2.3.2 Imperiled Species

For the purposes of this Management Plan, the term “Imperiled Species” refers to plant and animal species that are designated as Endangered, Threatened, or a Species of Special Concern by FWC, or that are designated as Endangered or Threatened by the U.S. Fish and Wildlife Service. This designation is also commonly known as “listed species.”

On November 8, 2010, new threatened species rules approved by the FWC were implemented. All federally listed species that occur in Florida will now be included on Florida’s list as federally-designated Endangered or federally-designated Threatened species. In addition, the state has implemented a listing process to identify species that are not federally listed, but that may be at risk of extinction. These species will be called state-designated Threatened. All previous state-designated imperiled species were grandfathered on the list and are currently undergoing status reviews. The FWC will continue to maintain a separate Species of Special Concern category until all the former imperiled species have been reviewed and those species are either determined to be state-designated Threatened or removed from the list.

Table 13. Imperiled Species Documented or Expected* to Occur at AWMA

Common Name	Scientific Name	Status
Birds		
Little blue heron	<i>Egretta caerulea</i>	SSC
Snowy egret	<i>Egretta thula</i>	SSC
Tricolored heron	<i>Egretta tricolor</i>	SSC
White ibis	<i>Eudocimus albus</i>	SSC
Wood stork	<i>Mycteria americana</i>	FT
Reptiles		
Alligator snapping turtle	<i>Macrochelys temminckii</i>	SSC
American alligator	<i>Alligator mississippiensis</i>	FT (S/A)
Eastern indigo snake*	<i>Drymarchon couperi</i>	FT
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SSC
Gopher tortoise	<i>Gopherus polyphemus</i>	ST

Abbreviations: Federally-designated Threatened (FT), Federally-designated Threatened because of similarity of appearance [FT(S/A)], State-designated Threatened (ST), or State Species of Special Concern (SSC). * = expected to occur but not documented.

2.3.3 FWC Wildlife Observations and FNAI Element Occurrences

A diversity of wildlife species are found on the AWMA. The FNAI element occurrence records include several imperiled plant and animal species. As defined by FNAI, an “element” is any exemplary or rare component of the natural environment, such as a species, natural community, bird colony, spring, sinkhole, cave, or other ecological feature. An element occurrence is a single extant habitat which sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element. FNAI assigns a rank to each “element” occurrence. This ranking system was developed by The Nature Conservancy and the Natural Heritage Program Network based on the element’s global rank (element’s worldwide status) or state rank (status of element in Florida). The FNAI ranking system and definitions are located on the following website: www.fnai.org/ranks.cfm.

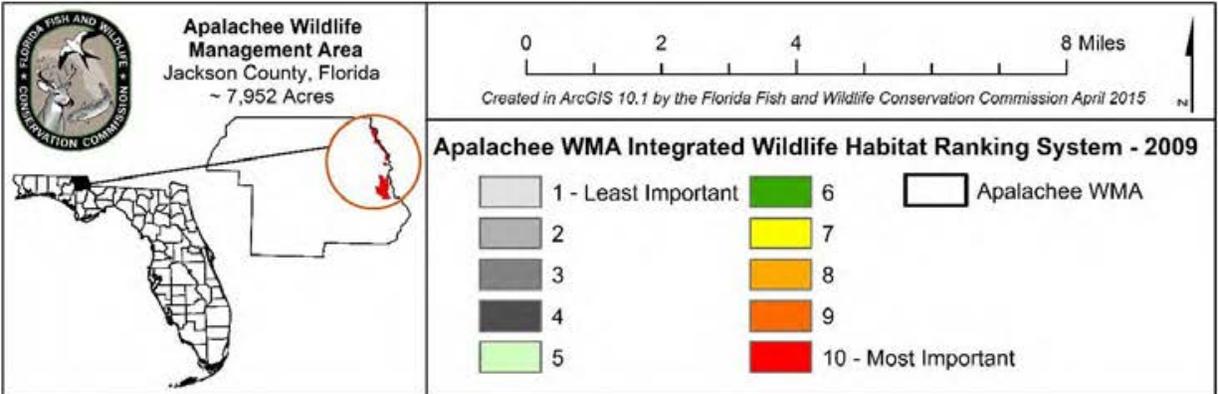
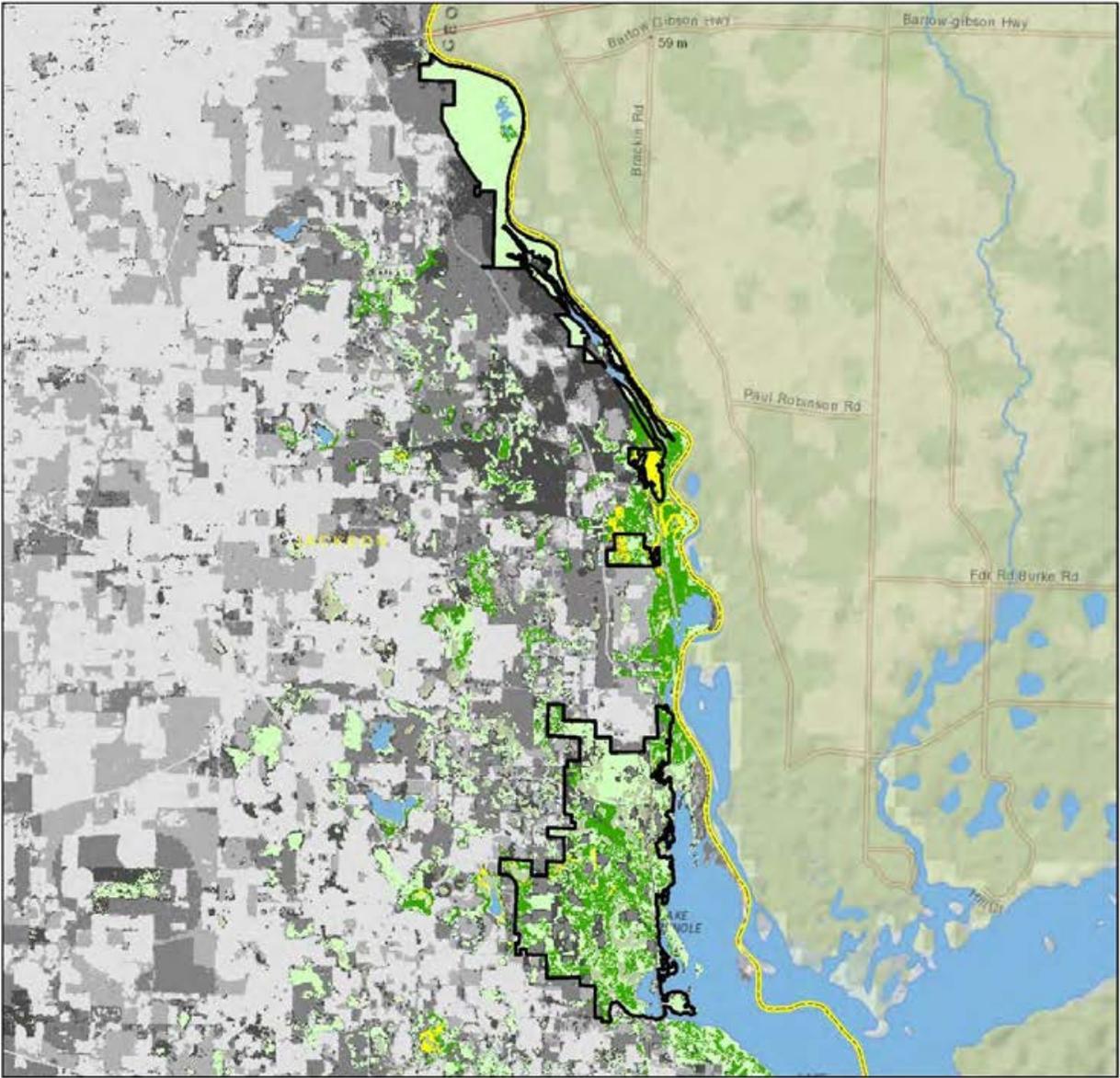


Figure 12. AWMA IWHRs - 2009

Known locations of FWC wildlife occurrences and FNAI element occurrences from the most recent GIS databases of the respective agencies are displayed in Figures 13 and 14. Appendix 13.6 contains a letter from the FNAI authorizing the FWC to utilize their database for the purpose of displaying known plant and animal resources.

2.4 Native Landscapes

Though the creation of Lake Seminole via the construction of the Jim Woodruff Dam has altered the historic natural community composition at AWMA, the area retains natural communities that have been minimally changed. Native landscapes at AWMA include sandhills, upland pine, and upland mixed woodland. Notably, the FNAI has designated areas in Zone A as reference sites for both upland pine and upland mixed woodland communities as well as having listed the sandhill communities as ground cover restoration donor sites for their exceptional natural quality. Complete descriptions of the natural communities found on AWMA may be found in Section 2.2.1 of this Management Plan.

2.5 Water Resources

The AWMA is situated below the confluence of the Chattahoochee and Flint River systems adjacent to Lake Seminole. The Chattahoochee and Flint Rivers flow south into Lake Seminole. Consequently, Lake Seminole drains into the Apalachicola River at the Jim Woodruff Dam. As described above, the Jim Woodruff Dam was constructed for navigation, hydro-power, and recreation purposes on the Apalachicola, Chattahoochee, and Flint River systems. Construction of the project began in 1947 and was completed in 1957. The dam created the reservoir known as Lake Seminole.

The majority of surface water on AWMA is clastic upland lakes, impoundment, sandhill upland lakes, sloughs and potholes. The only named bodies of water within AWMA are in Zone A. Zone A contains Sand Lake and Mill Pond. Most of the hydrology on AWMA is controlled by the water level of Lake Seminole. Lake Seminole is designated as open water. All surface waters of the State are classified by the DEP according to designated uses as described in Chapter 62-302.44 FAC. The surface waters of AWMA are designated as Class III, and classified for fish consumption; recreation, as well as propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The Chattahoochee River and Lake Seminole have been classified by the DEP as Class IIIF (fresh) waters. 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 FAC). There are no OFW on or adjacent to the AWMA.

The underlying aquifer in AWMA and Jackson County is the Floridan Aquifer. This aquifer transports its water through carbonate rocks. The Floridan Aquifer is one of the highest producing aquifers in the world. It is found throughout Florida and extends into the southern portions of Alabama, Georgia, and South Carolina. This aquifer system is comprised of a sequence of limestone and dolomite, which thickens from about 250 feet in

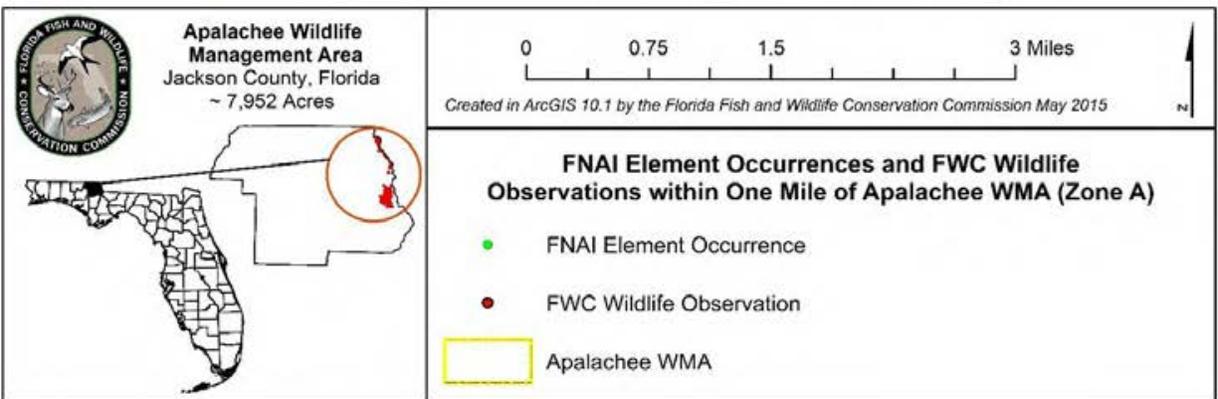
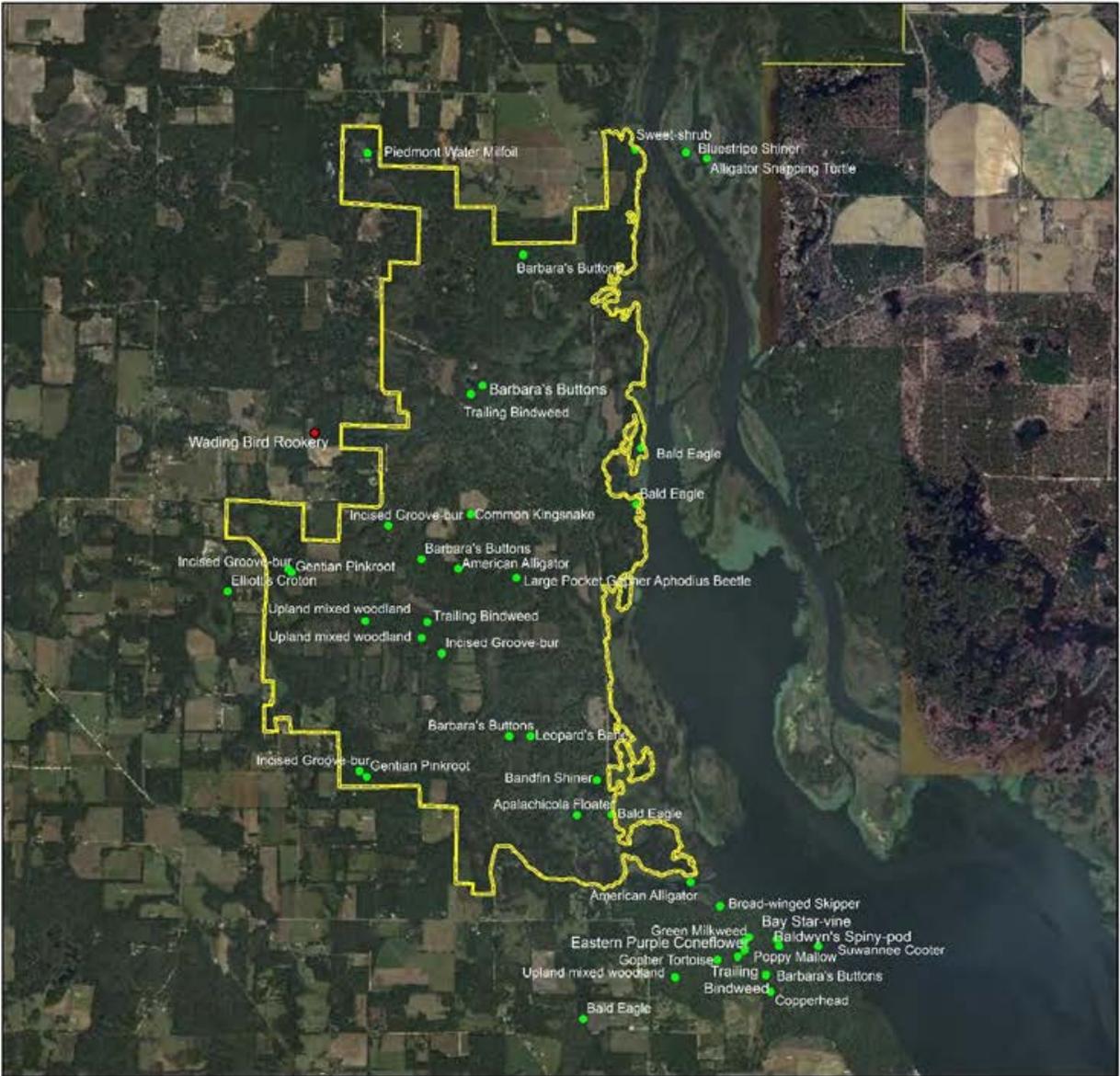


Figure 13. FNAI Element Occurrences and FWC Wildlife Observations: Zone A

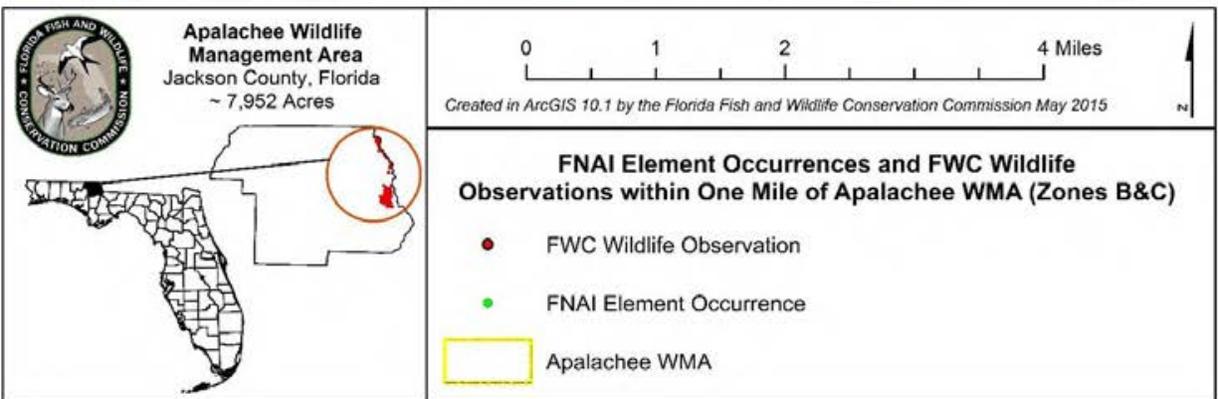
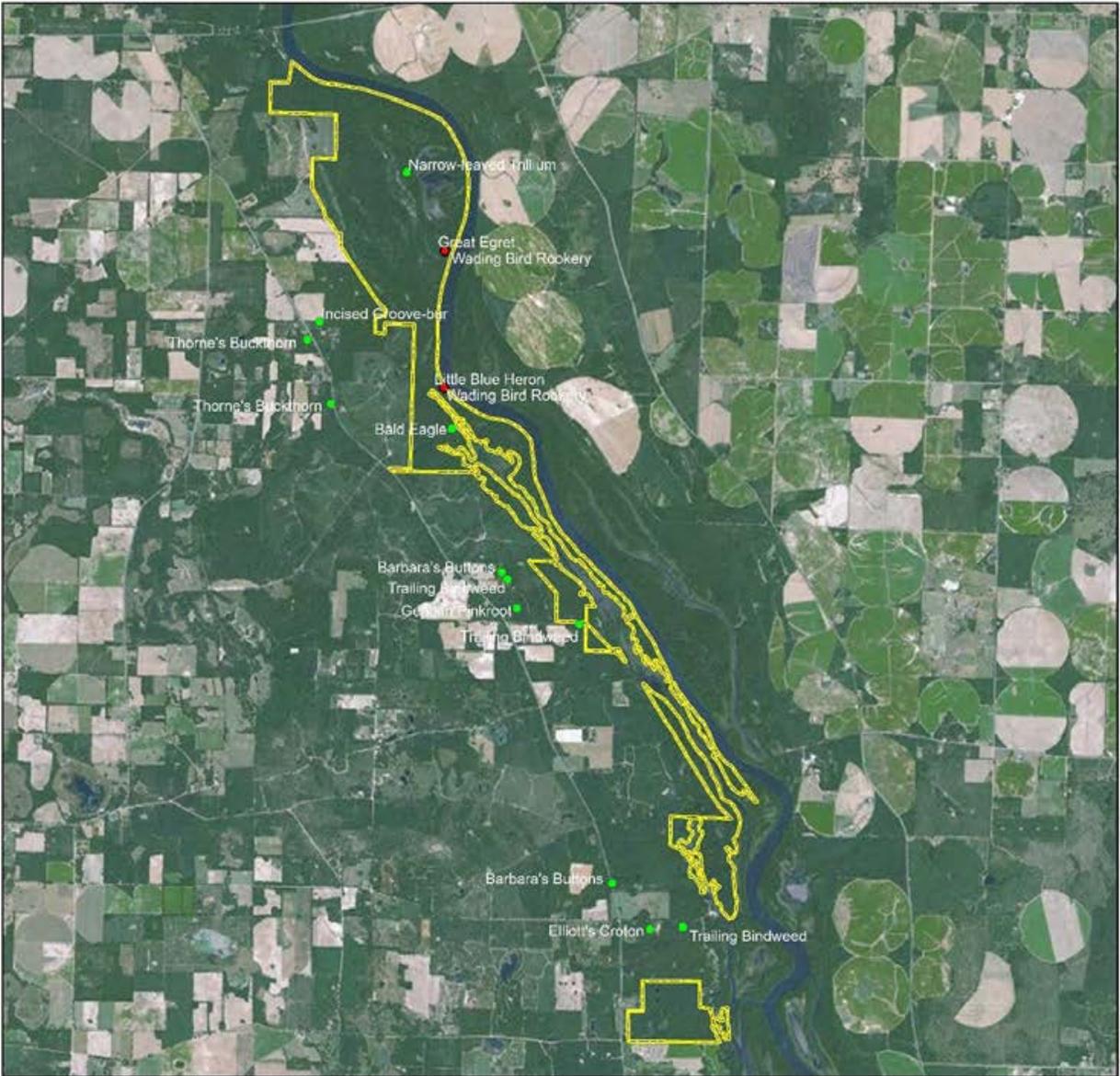


Figure 14. FNAI Element Occurrences and FWC Wildlife Observations: Zones B & C
 Florida Fish and Wildlife Conservation Commission | Apalachee WMA Management Plan

Georgia to about 3000 feet in south Florida.⁵ The Floridan Aquifer system has been divided into an upper and lower aquifer separated by a unit of lower permeability. The upper Floridan Aquifer is the principal source of water supply in most of north and central Florida. Groundwater flow is generally from highs near the center of the state towards the coast.⁵

2.6 Beaches and Dunes

There are no beaches or dunes located on AWMA.

2.7 Mineral Resources

Mineral resources in Jackson County include clay, dolomitic limestone, limestone and sand.⁶ Small alluvial clay deposits are scattered throughout the floodplains of the Apalachicola and Chipola Rivers. Dolomitic limestone mines in Jackson County are centered around the Chipola River in the south-central region of the county. Limestone is mined in the County as a base course material for roads and asphalt aggregate. Sand is found throughout Jackson County and mined for fill material. Potential mineral resources on AWMA include sand and clay. However, there are no active or planned mineral mines located on AWMA.

2.8 Cultural Resources

The ACOE retains responsibility for the management, monitoring, and protection of all cultural resources on AWMA (see Appendix 13.7). However, cultural and historical sites on the area are also recorded in the Florida Department of State's Division of Historical Resources (DHR) Master Site File. These observations are broken down into five categories: archeological sites, resource groups, historical structures, historic bridges, and historical cemeteries. To date, the DHR Master Site File indicates there have been three field surveys conducted on parts of AWMA with a total of 85 archaeological sites and one historic cemetery (Robinson Cemetery: JA01857) documented (Appendix 13.7). Sites include 23 ceramic scatters, two prehistoric habitations (JA00014 and JA00033), 30 sites containing prehistoric lithics, and four prehistoric middens. The FWC will submit subsequently located cultural sites on the AWMA to the ACOE and to the DHR for inclusion in their Master Site file.

2.9 Scenic Resources

The AWMA offers scenic views of the Chattahoochee River and Lake Seminole as well as actively managed upland pine and sandhill habitats. County Road 271 bisects much of Zone A, providing easy access for viewing superb vistas of the area's wildlife and scenic natural resources. Additionally, AWMA is part of a network of sites along the Great Florida Birding & Wildlife Trail, which includes areas across the state selected for their



Wildflowers at AWMA, *David Moynahan*

excellent bird watching, wildlife viewing, or educational opportunities. Wetland habitats host alligators, wading birds, waterfowl and beavers. Species such as deer, northern bobwhite, fox squirrel and gopher tortoise thrive in the uplands.

3 Uses of the Property

3.1 Previous Use and Development

Prior to European settlement, the landscape of Florida, including this area of the Florida panhandle, was settled and used by a variety of aboriginal peoples whose culture relied mainly on hunting, fishing, and subsistence agriculture. Several important archaeological sites located on the area document the presence of Native Americans occupying the lands within AWMA over many thousands of years. In fact, the area's name is derived from one of the more prominent tribes that lived in Florida's panhandle region the Apalachee, who were renowned for their advanced culture, agricultural practices and reputation as courageous and skilled warriors. Though some land alteration occurred, only minor alteration of the landscape is thought to have taken place until the advent of European settlement beginning with the Spanish occupation of Florida in the sixteenth century.

Along with more advanced agricultural practices, the Spanish and other settlers brought livestock, primarily cattle and hogs, as well as horses to Florida. This began an era of broad use of the landscape for agriculture. Rangeland cattle grazing and other agricultural practices began to be utilized in a more systematic way and occurred throughout much of the central Florida peninsula through most of the European settlement era from the 16th through the 20th centuries. Use of these agricultural practices began an era of increased alteration of the natural landscape. However, it wasn't until the 19th and 20th centuries that major settlement and more extensive alteration of the landscape in the area began with the widespread use of agriculture and associated development.

Native Americans continued to live on the land that is now AWMA until the early part of the nineteenth century. Between 1825 and 1838, a portion of Econchatimico's Indian Reservation was located on what is now Zone A, from River Road east to the Chattahoochee River. Econchatimico was a Creek/Seminole chief who remained in the area through the Second Seminole War in Florida, before being relocated to Oklahoma in October 1838.⁷ The waters of Lake Seminole now inundate most of what was reservation land. From the mid-19th century to 1955, most of AWMA's uplands were converted to family homesteads and used for farming and cattle grazing. There is evidence of turpentine production occurring on the northwest



Jim Woodruff dam and lock, 1958. *State Archives of Florida*

portions of the property and of timber harvests in the bottomlands before the creation of Lake Seminole.

As discussed above, the Lake Seminole project, originally authorized as the Jim Woodruff Lock and Dam Project by the River and Harbor Act of 1946, was the first of three locks and dams constructed for navigation, hydro-power, recreation and related use purposes on the Apalachicola, Chattahoochee, and Flint River systems. Construction of the project began in 1947 and was completed in 1957.⁸ The dam created the reservoir known as Lake Seminole. This area was established as a wildlife management area in 1955 when over 5,000 acres were leased to the GFC, FWC's predecessor agency, by the ACOE.

3.2 Current Use of the Property

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

Current and anticipated resource uses of the property are diverse. Hunting continues to be a popular recreational activity on AWMA. The area also offers excellent opportunities for bird watching, especially for wintering waterfowl, a year-round variety of wading birds, and summer visitors such as Mississippi and swallow-tailed kites. The AWMA is a particularly good spot for raptors, woodpeckers and flycatchers, with bald eagle, osprey, pileated woodpecker, eastern wood-pewee, Acadian flycatcher, great crested flycatcher and eastern kingbird all breeding on the area. The diversity of vegetation not only harbors a variety of bird species but also provides good opportunities for mammalian wildlife viewing. Other uses include hiking, photography, biking, boating, paddling, sightseeing, and horseback riding.

Due to the proximity of population centers in Jackson County and surrounding counties, public use can be expected to increase as public awareness of opportunities increases. The FWC administers hunts in the fall and spring for various game species including small game, deer, turkey, feral hogs, quail, and migratory birds, which have accounted for an average of 1,959 man-days annually over the last five years. Fishing and frogging are allowed year-around at AWMA.

3.2.1 Visitation and Economic Benefits

Visitation and public use of the area for fish and wildlife based public outdoor recreational opportunities is the primary source of economic benefits from AWMA, and contribute to the

overall economy for this region of Florida. In Fiscal Year 2013-14, an estimated 25,851 people visited the AWMA. Primarily, as a result of this visitation and use of the area, FWC economic analysis estimates indicate that the AWMA generated an estimated annual economic impact of \$2,953,477 in retail sales for the State and the northwest Florida region. This estimated annual economic impact has aided in the support or creation of an estimated 51 jobs. In addition, the FWC receives additional revenue from some of the agricultural leases on the area while the ACOE receives revenue generated from timber harvesting operations.

Further revenue generating potential of the AWMA will depend upon future uses described in this Management Plan. Additional revenue from environmental lands such as the AWMA might include sales of various permits and recreational user fees and ecotourism activities, if such projects could be feasibly developed. 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 considered to be significant to local and regional land and water resources, as well as human health.



Paddlers at AWMA, FWC

3.3 Single- or Multiple-use Management

The AWMA will be managed under the multiple-use concept as a Wildlife Management Area. The AWMA will provide fish and wildlife resource based public outdoor recreation and educational opportunities, while protecting the natural and cultural resources found on the area. Any natural and cultural resources of AWMA will be managed under the guidance of the ACOE, the ARC, the DHR, and the Conceptual State Lands Management Plan, and as outlined in the original purposes for acquisition.

3.3.1 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 AWMA. Uses classified as “Approved” are considered to be in accordance with the purposes for acquisition, in concurrence with the lease agreement with the ACOE, as well as with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals and objectives as expressed in the Agency Strategic Plan (Appendix 13.8). Uses classified as "Conditional" indicate that the use may be acceptable but will be allowed only if approved through a process other than the management plan development and approval process (e.g., special-use permitting, managed-area regulation and rule development). Uses classified as “Rejected” are not considered to be in accordance with the original purpose of acquisition or one or more of the various forms of guidance available for planning and management:

	<u>Approved</u>	<u>Conditional</u>	<u>Rejected</u>
Apiaries		✓	
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 sites	✓		
Preservation of historical sites	✓		
Primitive camping			✓
Protection of imperiled species	✓		
Off-road vehicle use		✓	
Shooting Sports Park			✓
Soil and water conservation	✓		
Timber harvest	✓		
Wildlife observation	✓		

3.3.2 Incompatible Uses and Linear Facilities

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

Moreover, because all of the lands encompassed within AWMA are owned by the ACOE, any review of a linear facilities or incompatible use request on the area is solely under the

jurisdiction and authority of ACOE and its governing laws. Consequently, the regulations and state planning requirements governing linear facility and incompatible use requests on state-owned conservation land recommendations does not apply. As such, the ACOE has the sole decision-making authority for considering the determination of any linear facility or incompatible use requests on AWMA.

3.3.3 Assessment of Impact of Planned Uses of the Property

To communicate FWC’s planned uses and activities, specific management intentions, long- and short-term goals and with associated objectives, identified challenges, and solution strategies have been developed for AWMA (Sections 5-8). 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.

3.4 Acreage Recommended for Potential Surplus Review

On conservation lands where FWC is the lead manager, the FWC evaluates and identifies recommended areas for a potential surplus designation by the DSL, the 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 Fla. Stat.), as well as surplus restrictions for lands acquired through the Federal Aid in Wildlife Restoration Act (Pittman-Robertson) or through other federal grant programs.

Since all of the lands encompassed within AWMA are owned by the ACOE, any review of their surplus potential would fall under the authority of ACOE and its governing laws and regulations and the state planning requirement to conduct a review of the potential for surplus land recommendations does not apply. The ACOE has the sole authority for any potential surplus review and designation of lands as potential surplus.

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

4 Accomplished Objectives and Management Activities

Though FWC has been granted lead management of the AWMA by the ACOE since 1955, this 10-year land Management Plan is the first to be completed for the area. The License Agreement between the FWC and the ACOE requires that the FWC submit annual plans

describing management activities to the ACOE. Section 1.1 above describes the FWC's rationale for developing this Management Plan in addition to the annual reports required by the ACOE. Due to the FWC's long history of managing the area, this section is dedicated to reporting major management activities and accomplishments over the previous 10 years. Additional accomplishments for the AWMA are further discussed in more comprehensive detail throughout **Section 5 Management Activities and Intent** of this Management Plan.

Accomplished Objectives and Management Activities	
Activity	Description
Annual reporting	Each year the ACOE requires the completion of an Annual Report which documents all aspects of management actions done on the area for the fiscal year. The bulk of information is related to hunting and harvest data, land management activities, animal surveys, and the annual work plan. The ACOE also requires an annual report of pesticide use on the area.
Cultural resource monitoring	Eighty-five cultural sites have been documented on AWMA that are annually monitored in cooperation with the ACOE. In 2011, two new cultural sites were described by the AWMA area biologist and added to the Florida Master Site File by DHR (JA01857 Butler Plantation and JA01858 Robinson Cemetery).
Timber management	Timber management is a cooperative effort with the ACOE and timber thinning on identified areas of Zone A began in 1997. The primary objectives are to reduce basal area and restore natural communities. In 2008 the area biologist completed a timber assessment/plan that identified 1,364.5 acres requiring thinning. The attributes of the delineated stands, and the prescriptions for thinning each stand were recorded. The plan was initiated in 2010 and 804.7 acres have been thinned since. Approximately 279.8 acres are currently marked for thinning and an additional 279.9 acres are scheduled for thinning by the end of Fiscal Year 2015-16.
Tree and shrub planting	Approximately 20 acres of bicolor lespedeza were planted in the late 1990s and early 2000s to break up large agricultural fields and to improve habitat for quail along field margins and wildlife openings. These plantings are maintained each year by mowing in the spring, occasionally burning, and by fertilizing with potash every two to three years. In May 2014, the FWC planted 11 acres of upland pine natural community with longleaf pine with the assistance of ACOE.
Prescribed burning	Staff at AWMA institute an aggressive prescribed burning program where at least 60-70% of the upland habitats are burned annually. Between 2005 and 2011 a total of seven new burn units, not previously managed with fire, were established totaling 445.5 acres. Currently 3,468 acres have been delineated into 59 burn units. Over the past five years, an average of 1,870.5 acres have been burned annually. In conjunction with the establishment of the new burn units, new firebreaks were constructed around the perimeters where applicable. Currently 8.6 miles of disked lines and 2.7 mile of ditches are

	<p>maintained as firebreaks. Over 13 miles of area roads are also used as firebreaks by using a hay rake to remove leaf litter and pine straw and to lightly fluff the road dirt.</p>
Exotic plant control	<p>Efforts are made to treat all Category I and II invasive plant species occurring on the area. In conjunction with treatments by AWMA staff, since 2008, staff have requested funding from the FWC Upland Invasive Exotic Plant Section (UIEPS) for contractual services with \$191,537 received for initial and maintenance treatments of <i>Lygodium japonicum</i>. Survey and treatments for Fiscal Year 2011-12 consisted of the following; 780 acres of <i>Lygodium</i> surveyed and treated, 256 stems of Chinaberry, 150 stems of Chinese tallow, and 33 stems of mimosa were treated by area staff. Additionally, over 280 acres of <i>Lygodium</i> were treated by contractors utilizing UIEPS funds. Fiscal Year 2012-13 resulted in in-house treatments of 681 acres and 265 acres treated by contractors for <i>Lygodium</i>. Similar scopes of treatment of invasive exotic trees were also completed.</p>
Upland restoration	<p>Most of AWMA's upland communities are in maintenance condition, however some areas need special management actions in conjunction with prescribed burning to accomplish restoration and improve optimal habitats. This mainly includes using the Gyro-trac or brown tree cutter to remove mid-story hardwoods to allow prescribed fire to be more effective. The AWMA received funds to help support ongoing management activities associated with restoring sandhill and scrub natural communities on FWC managed lands from the FWC administered State Wildlife Grant Program. Nearly \$50,000 dollars was dispersed for AWMA over a three year period (January 1, 2010 to December 31, 2012). Upland restoration activities for hardwood control and pine thinning were accomplished on 274 acres of upland communities since Fiscal Year 2008-09, of which, sandhill restoration activities were completed on 125.9 acres that were supported by the aforementioned grant funding.</p>
Animal surveys	<p>A multitude of wildlife surveys have been conducted on the area. Deer spotlight counts are conducted annually in the early fall to assess population trend data and have been done since 1983. The line-transect protocol adapted to deer spotlight count surveys has been used since 2008. Quail fall covey call count surveys are conducted annually and began in 2008 using protocols developed by Tall Timbers Research Station and adapted for use by the Uplands Ecosystem Restoration Program. In Fiscal Years 2009-10 and 2014-2015, gopher tortoise surveys were conducted on the area's sandhill communities. The WCPR Strategy implemented on the area prompted the need to conduct call back point counts for Bachman's sparrow and brown-headed nuthatch to determine occupancy and distribution of these focal species once every three years. In February 2013 and November 2014, gopher frog call surveys were conducted to determine the occupancy of the species on the area. The surveys resulted in no gopher frogs being detected.</p>
Herbaceous seeding	<p>There are 525 acres of dedicated agricultural fields on AWMA. Area staff plant and manage 130 acres for wildlife food plots and dove fields while the remaining acreage is leased out to local farmers. The farmers can only plant crops approved by the area manager and are required to leave 10% of the crop</p>

	for consumption and use by wildlife. Occasionally, wildlife openings are supplemented with crops such as crimson clover and winter wheat to improve the quality of habitat.
Nest Structures	Since 1989 wood duck nesting boxes have been monitored and maintained on AWMA. The number of boxes has increased periodically throughout the years to the current count of 150 boxes. Fifty new nesting boxes were erected from 2007 to 2011 and over 90% of the original older boxes were replaced. Monitoring data suggest that nearly 80% of the boxes are utilized for at least one nesting attempt.
Native vegetation management	The manipulation and management of approximately 110 acres of wildlife openings by mowing and disking contributes to early successional plants species and improved wildlife habitat. Most of the other management activities, such as hardwood control and mulching, are mentioned in the upland restoration section above.
Public use administration (hunting)	Due to the high quality and diversity of its natural habitats, agricultural lands and wildlife openings, the AWMA provides more hunting opportunities than most other public hunting areas of similar size, while still providing high quality hunting and maintaining a high level of hunter satisfaction. The AWMA boasts some of the larger bucks harvested in the state and biological data is collected on nearly all deer harvested at the mandatory check station. Northern bobwhite are the premier game species for the area and it offers some of the most promising hunting prospects on public land in northwest Florida. All game taken on the area must be reported at the check station and harvest data is collected. Between Fiscal Year 2008-09 and Fiscal Year 2012-13, hunter use accounted for an average of 1,959 man-days annually.
Public use administration (non-hunting)	Staff monitors and collects traffic counter data at three designated locations for visitor use calculations. Occasionally AWMA is used to host field trips for nearby conferences. There is also much continuing interest, study, and use of the area from native plant societies and other conservation groups as well. Furthermore, AWMA was recently used for specimen collection by researchers from Harvard University and the Ohio State University.
Facilities and infrastructure	Major buildings currently existing on the area include the residence, office building, workshop, various pole barns, storage sheds, and the check station. The buildings require annual maintenance and occasional repairs. The check station is one of few in FWC's entire state WMA system that receives all of its electrical power solely from by solar power. Approximately 14.5 miles of roads open for motorized vehicle traffic are maintained annually by mowing and by conducting spot repairs to washouts and pot holes. Over two miles have been improved by capping with lime rock road base material since Fiscal Year 2008-09. Some sections of the roads are periodically reshaped using a road grader to pull back in fill dirt that has rutted out. In Fiscal Year 2012-13, staff established 2.74 miles of access roads on Zone B that are closed to vehicular traffic and are extensively used by hunters and wildlife viewers. These were put in by removing underbrush by the Gyro-trac on remnant road

	beds and will be maintained by annual mowing only. A total of 5.6 miles of access roads are maintained on the area.
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5 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 nonrenewable cultural resources. In general, the FWC management intent for 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 FWC's intent to provide quality fish and wildlife resource based public outdoor recreational opportunities on 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 earlier, the management activities described in this section are in compliance with those of the Conceptual State Lands Management Plan.

5.1 Land Management Review

As noted above, title to the AWMA is held by the ACOE, therefore, no land management review (LMR) has yet been conducted on AWMA. However, because the FWC receives state funding for management of its wildlife management areas, it is possible that a LMR could be conducted on the AWMA in the future. See Section 1.1 for a description of CARL management funding and associated requirements.

5.2 Adaptive Management

Adaptive management is "learning by doing";⁹ it is the adjustment or modification of conservation actions to achieve a desired conservation goal. In practice, adaptive management is a rigorous process that includes sound planning and experimental design with a systematic evaluation process that links monitoring to management.^{9, 10} Adaptive management requires flexibility for implementation, but should be fitted over a fundamentally sound, well-planned design.

An adaptive management process produces the strongest inference and most reliable results when experimental design components are incorporated into the monitoring process. Adaptive management is most rigorously applied in an active format when components of experimental design (i.e., controls, replication, and randomization) are included in the monitoring process.^{10, 11} Incorporating valid statistical analyses of results will further enhance the value of the adaptive management process. However, in some situations, rigorous experimental design procedures can be relaxed without invalidating monitoring results. In a passive format, adaptive management can involve applying a conservation action at a site, observing the results and adjusting the action in the future if warranted.¹⁰

Proposed adaptive management, monitoring and performance measures are developed through literature reviews and FWC staff meetings. Overall, a results-based approach is incorporated into this 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 AWMA.

5.2.1 Monitoring

A well-developed monitoring protocol is also one of the principal, required criteria for the management of AWMA. Monitoring and performance measures are important, but often overlooked elements of conservation planning. Monitoring provides the critical link between implementing conservation actions and revising management goals.

Monitoring is the systematic, repeated measurement of environmental characteristics to detect changes, and particularly trends, in those characteristics. Monitoring provides essential feedback, the data needed to understand the costs, benefits, and effectiveness of planned conservation actions and the management projects undertaken to address them.¹⁰

For natural communities, monitoring protocols are established through FWC's Objective-Based Vegetation Management (OBVM, Section 5.3.1) program, which monitors how specific vegetative attributes are responding to FWC management.

The FWC conducts a variety of wildlife monitoring and surveying on AWMA. Annual deer spotlight counts have been conducted since 1983 to assess population trend data. Northern bobwhite covey counts are conducted during the fall using protocols developed by Tall Timbers Research Station and adapted for use by the Uplands Ecosystem Restoration Program. The FWC conducted a baseline gopher tortoise survey on the area's sandhill communities in Fiscal Year 2009-2010 and an additional survey was conducted in January 2015. The FWC has maintained and monitored wood duck nesting boxes at AWMA since 1989. Monitoring data suggest that nearly 80% of the boxes are utilized for at least one nesting attempt

For imperiled and focal fish and wildlife species, monitoring protocols are established through FWC's Wildlife Conservation Prioritization and Recovery (WCPR, Section 5.4.2) program. Per the WCPR Strategy, the FWC conducts call back point counts for Bachman's sparrow and brown-headed nuthatch to determine occupancy and distribution of these focal species once every three years. The FWC conducted gopher frog call surveys in February 2013 and November 2014 following heavy rain events without documenting the species. Area staff may monitor additional fish and wildlife species when deemed appropriate.

Exotic and invasive plant and animal species (Section 5.5) are also monitored as needed and appropriate. Recreational uses are monitored through FWC's Public Access and

Wildlife Viewing Services program, and work in conjunction with the establishment and adjustment of public access carrying capacities (Section 5.6.3). The AWMA's cultural and historical resources (Section 5.9) are annually monitored in cooperation with and with guidance from the ACOE.

5.2.2 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.

5.2.3 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 (OBVM, WCPR, Public Access and Wildlife Viewing Services, Recreation Master Plans, etc.) underway to accomplish needed conservation actions that are planned to manage the natural resources of 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.

5.3 Habitat Restoration and Improvement

On AWMA, the FWC will focus on managing for native habitat quality, emphasizing maintenance of high-quality natural communities, and restoration of disturbed areas. Restoration may be achieved on disturbed areas by the re-introduction of fire, restoring historic hydrological conditions and/or the use of mechanical or chemical forest management techniques as appropriate. Retention of the native old growth component of forests, while also providing for natural regeneration, remains an important consideration. The AWMA has high-quality native communities including upland pine, bottomland forest, upland hardwood forest, upland mixed woodland, floodplain swamp and sandhill that the FWC will continue to manage and protect. On disturbed upland sites, the FWC has initiated ground cover and natural community restoration.

The FNAI has conducted surveys and mapped the current vegetative communities and historic vegetation communities on AWMA. This information will be used to guide and prioritize management and restoration efforts on the area. Section 5.3.3 below provides extensive detail about the ongoing habitat restoration and improvement activities on

AWMA.

5.3.1 Objective-Based Vegetation Management

The FWC uses a comprehensive resource management approach to managing its conservation lands. 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 attributes are responding to FWC management.

The first step in implementing OBVM is to map the current, and in most cases the historic natural communities, on the managed area using the FNAI Natural Community Classification. The FWC contracts with the FNAI to provide these mapping services, and plans to have natural community maps recertified on most areas on a five-year basis. A natural community, as defined by the FNAI, is a distinct and recurring assemblage of populations of plants, animals, fungi and microorganisms naturally associated with each other and their physical environment. As described above, the FWC completed natural community mapping of Zone A in 2009 and all Zones in 2015.

After natural communities have been mapped, management units are delineated. Delineating management units takes into account the distribution and extent of the current and/or historic mapped natural communities, existing and proposed infrastructure, and other management considerations. Through OBVM monitoring, the FWC collects data on a number of specific vegetation attributes that provide insight about the condition of the natural community. Because the FWC is interested in the overall effect of management on the natural communities, OBVM data is analyzed at the natural community level. Measurable habitat management objectives referred to as ‘desired future conditions’ are established for each actively managed natural community. Desired future conditions are the acceptable range of values for quantifiable vegetation attributes, such as basal area, shrub height and cover, and ground cover. The FWC collaborated with the FNAI to identify ‘reference sites’ for each actively managed natural community and applied the OBVM monitoring methodology at these reference sites to determine what attribute values occur in a high-quality community (<http://www.fnai.org/reference-natural-communities.cfm>). FWC staff considers the reference site attribute values when setting area-specific desired future conditions for natural communities. Notably, the upland pine and upland mixed woodland communities on AWMA have been designated as FNAI reference communities.

Vegetation monitoring samples the selected attributes, with the results being compared to the established desired future conditions. All monitoring performed under OBVM is completed using the program’s Standard Operating Procedures.

Consistent, long-term monitoring of managed natural communities on AWMA along with other areas will quantify changes in habitat conditions, provide information on the

cumulative effects of management activities, and measure progress towards meeting management objectives for desired habitat conditions. Measured changes in vegetation condition are intended to be used to inform future land management actions.

Initial mapping and vegetation sampling of AWMA and other areas provides FWC staff with baseline data indicating natural community structure, distribution, and condition on the area. Comparing the subsequent monitoring results to desired future conditions, provides important operational information on a natural community's vegetation structural status at a given point in time and trend over time. Using this information, managers can evaluate, adjust and modify their management practices to meet the stated objectives. By comparing natural community mapping products through the years, managers can track progress in moving altered communities to functioning natural communities.

5.3.2 Prescribed Fire and Fire Management

Periodic spring and summer fires occurred in fire-adapted communities under natural conditions. Plant species composition reflects the frequency and intensity of these fires. In the absence of fire, fallow fields on former longleaf sites follow a successional pattern through mixed pine-hardwood forests to an exclusively hardwood community rather than to the original plant community. The plant species composition may differ slightly on poorer soils of the sandhills, but the dominant role of fire in controlling hardwoods is equally important in either ecosystem.

Timber removal, site preparation, drainage, and lack of fire have all combined to alter the plant species composition of the area resulting in a loss of fuel and inhibiting the return to a more "natural" fire management regime. Site-specific combinations of prescribed fire, mechanical and chemical vegetation control, reforestation, and restoration of natural water regimes are likely necessary actions needed to restore the area to historic natural communities.

The FWC employs a fire management regime to increase both species and habitat diversity and will continue a prescribed burning program on the AWMA in accordance with vegetative management objectives. As fire moves across a landscape, some areas carry fire better than others. Areas with higher vegetative fuel loads typically burn more evenly and with greater intensity. Areas with lower vegetative fuel loads or wetland areas inundated with water typically will not carry fire as evenly, and usually burn at a lower intensity. Employing a burning program with different burning frequencies, intensities, and seasonality (dormant season vs. growing season) of prescribed burns create habitat diversity and a mosaic of vegetation patterns. This mosaic is designed to have both frequently burned and infrequently burned aspects.

On some areas, prescribed burning is limited by the buildup of mid-story brush and a lack of pyrogenic groundcover fuels. This condition creates unsuitable habitat for many wildlife

species. Mechanical control of brush on upland sites by roller chopping, logging, shredding, mowing, or incidentally by equipment during commercial thinning operations, can reduce shading and encourage the grasses and forbs that are necessary to sustain prescribed fire. On AWMA, mechanical vegetation control of woody vegetation is primarily accomplished through the use of a drum mulcher or inertia disk cutter and rarely roller chopped.

Whenever possible, existing firebreaks such as roads and trails, as well as natural breaks such as creeks and wetlands, will be used to define burning compartments. Disk harrows, mowing, raking, and foam lines will be used as necessary to minimize disturbance and damage created by fire plows.

The transitional areas between two adjacent but different vegetative cover types, such as forests and wetlands, are known as ecotones.

With the possible exception of wildfire suppression, mechanical soil disturbance in ecotones will be avoided in order to protect habitats for rare species that often occur between flatwoods and riparian drainages. Creation of firebreaks are avoided when possible in these zones. Additionally, fires are allowed to burn into the edges of marshes, swamps and other wetlands in order to maintain these habitats.

The FWC institutes an aggressive prescribed burning program on AWMA where at least 60-70% of the upland habitats are burned annually. Emphasis is placed on conducting burns from March to May in order to reap most of the benefits of growing season burns, such as good hardwood control, while avoiding the peak nesting season for northern bobwhite on the area. Some burns are conducted in the late winter months so that the critical number of burn days required are available and annual burn objectives can be met. Other burning is done in late May and early June to promote native grass seed production for collecting later in the fall.

Between 2005 and 2011 a total of seven new burn units, not previously managed with fire, were established totaling 445.5 acres. In 2012, a small outlying area totaling 23.2 acres of upland pine was identified as Unit 59 and burned for the first time in April 2013. Currently 3,468 acres have been delineated into 59 burn units. Burn units range in size from 4-159 acres and utilize as many natural and existing firebreaks as possible.



Prescribed burn at AWMA, FWC

In 2009-10, burn units were more precisely digitized using GIS, resulting in a net loss of total acres from what had previously been reported. Firelines, other than natural fire breaks such as wetlands and Lake Seminole, consist of the following approximations; 8.6 miles of disked firelines, 13.7 miles of management area roads, 10.3 miles of county maintained roads, and 2.7 miles of ditches. Each burn unit was inspected and mapped to determine fuel type(s), fuel loading, burn history, special concerns, etc. These data are stored and manipulated with ArcGIS. The burn units have been consolidated into a plan designed to burn approximately 60-70% of the quail habitat annually (one-two year rotation), in a mosaic pattern intended to improve habitat diversity.

The 2013-14 burn season was the most productive since the advent of reliable records, with the highest annual burn acreage recorded, resulting in 2,175 acres (37 units) and 16 acres of agricultural land burned. Over the past five years, an average of 1,870.5 acres have been burned annually.

In addition to the prescribed fire management guidelines described above, an area-specific Prescribed Fire Plan was developed in June 2013 and implemented for AWMA (Appendix 13.9). This plan includes delineation of burn management units, detailed descriptions of prescribed fire methodology, safety, and smoke management guidelines.



ATV ignition during a prescribed burn, FWC

5.3.3 Habitat Restoration

Most of the AWMA's upland communities are in maintenance condition, however some areas need special management actions in conjunction with prescribed burning to accomplish restoration and improve optimal habitats. This mainly includes using the Gyrotrac or brown tree cutter to remove mid-story hardwoods to allow prescribed fire to be more effective.

The AWMA received, through Florida's State Wildlife Grants Program and gopher tortoise mitigation, funds from the FWC's Species Conservation Planning (SCP) section to help support ongoing management activities associated with restoring sandhill and scrub natural communities on FWC managed lands. Nearly \$50,000 dollars was dispersed for AWMA over a three year period (January 1, 2010 to December 31, 2012) covering portions of salary, fuel expenditures, herbicide purchases, and equipment repairs associated with the sandhill restoration activities. Upland restoration activities for hardwood control and pine thinning were accomplished on 274 acres of upland communities since 2009, of which

sandhill restoration activities were completed on 125.9 acres that were supported by the aforementioned grant funding.

In 2006, a ground cover restoration (GCR) site plan was completed to restore a 15-acre abandoned agricultural field to the historical upland pine vegetative community on AWMA. Near-term actions emphasize establishing wiregrass and longleaf pine on the site and maintaining the area in the future with prescribed fire.

In 2007-08, GCR activities included the collection of 150 lbs. of wiregrass seed from a donor site on AWMA and the planting of the wiregrass seed on the recipient site at a rate of 10 lbs/acre in January. In 2008-09 monitoring of the site showed that very little wiregrass had been established and it was determined that another planting was necessary. Site preparation of the recipient site by disking, burning, and herbicide treatments resumed in 2008-09 and was reseeded with wiregrass (10 lbs/acre) in December 2009. Monitoring in 2010 showed that some wiregrass has been established.

A moderate level of wiregrass and other native upland grass species has become established. Efforts to control bahiagrass on the site have not been as effective as desired because of the extensive rhizome network and continual reintroduction from a bordering pasture. In Fiscal Year 2013-14, the GCR site was burned in May to encourage wiregrass seed propagation, increasing natural seeding on the site, and to bolster competition with the bahiagrass. Nearly 240 acres of upland pine natural community were burned in late May and June 2014, to serve as wiregrass donor areas for the L. Kirk Edwards Wildlife and Environmental Area again in 2015.

5.4 Fish and Wildlife Management, Imperiled and Focal Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

5.4.1 Fish and Wildlife

Due to the variety of natural communities, a diversity of associated wildlife, including rare, imperiled, common game, and non-game species, can be found on AWMA. In managing for wildlife species, an emphasis will be placed on conservation, protection and management of natural communities. As noted above, natural communities important to wildlife include upland pine, bottomland forest, upland hardwood forest, upland mixed woodland, floodplain swamp, sandhill, and floodplain marsh. Natural communities that are less represented on AWMA include successional hardwood forest, basin marsh, basin swamp, dome swamp, and depression marsh.

As highlighted earlier, the size and natural community diversity of AWMA creates a habitat mosaic for a wide variety of wildlife species. Resident wildlife will be managed for optimum species richness, diversity and abundance. In addition to resident wildlife,

AWMA provides resources critical to many migratory birds including waterfowl, passerines, raptors, and others. Habitats important to migratory species will be protected, maintained or enhanced.

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 wildlife populations will be managed to provide continued recreational sport hunting and wildlife viewing 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.

Wildlife management emphasis is placed on documenting the occurrence and abundance of rare and imperiled species on the AWMA. The FWC will continue to update inventories for certain species, with emphasis on rare and imperiled fish and wildlife species. Monitoring of wildlife species will continue as an ongoing effort for the area.

Concurrent with ongoing species inventory and monitoring activities, management practices are designed to restore, enhance or maintain rare and imperiled species, and their habitats. 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 address rare and imperiled species requirements and habitat needs. Section 5.4.2 below provides further information on FWC's comprehensive species management strategy for rare and imperiled wildlife and their respective habitats.



Red-headed woodpecker, FWC

5.4.2 Imperiled 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 managing 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 FWC management, and uses the WCPR program to ensure management is having the desired

effect on wildlife.

The goal of WCPR is to provide assessment, recovery, and planning support for the FWC-managed areas to enhance management of focal species and the recovery of imperiled species. WCPR program objectives include prioritizing what the FWC does for imperiled and focal species on FWC-managed areas; ensuring the actions taken on these areas are part of statewide conservation programs and priorities; and informing others about the work accomplished on lands the FWC manages.

The WCPR program helps the FWC take a proactive, science-based approach to species management on FWC-managed lands. This approach assesses information from statewide potential habitat models and Population Viability Analysis, and in conjunction with input from species experts and people with knowledge of the area, creates site-specific wildlife assessments for imperiled wildlife species and a select suite of focal species. Staff combines these assessments with area-specific management considerations to develop a wildlife management strategy for the area. Each strategy contains area-specific measurable objectives for managing priority species and their habitat, prescribes management actions to achieve these objectives, and establishes monitoring protocols to verify progress towards meeting the objectives. 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 endangered and threatened fish and wildlife species (see http://myfwc.com/media/1515251/Threatened_Endangered_Species.pdf), as well as select focal species found on the area.

The FWC held a WCPR Workshop July 20-21, 2011 for AWMA and the Judges Cave Wildlife and Environmental Area (JCWEA) to bring decision makers together to discuss an assessment of the opportunity and needs; identify measurable objectives; determine necessary actions including monitoring; and identify necessary coordination efforts. The FWC developed a WCPR Species Management Strategy for AWMA jointly with JCWEA in February 2012 ([Appendix 13.10](#)).

In summary, for FWC-managed areas, the WCPR program helps assess imperiled and focal wildlife species needs and opportunities, prioritize what FWC does for imperiled and focal species, prescribe management actions to aid in species recovery, prescribe monitoring protocols to allow evaluation of the species' response to management, and ensure the information is shared with others. Through the actions of this program, the FWC will facilitate fulfilling the needs of



Fox squirrel at AWMA, FWC

focal and imperiled wildlife species on AWMA. In the long-term, by implementing these 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 imperiled species and preventing the future imperilment of declining wildlife species.

5.4.3 Focal Species Selection and Management

The following are excerpts from FWC's WCPR Species Management Strategy for AWMA ([Appendix 13.10](#)):

The FWC's land management focuses on restoring the natural form and function of natural communities. However, in some instances, it is important to consider the needs of specific species, and it is necessary to monitor the impacts of natural community management on select wildlife to ensure management is having the desired effect. To ensure a focused, science-based approach to species management the FWC uses the focal species concept embraced by the Wildlife Habitat Conservation Needs in Florida project. The focal species approach incorporates a variety of concepts and considerations that, if applied correctly, allow one to identify the needs of wildlife collectively by strategically selecting a subset of wildlife species. The species selected as focal species include umbrella species, keystone species, habitat specialists, and indicator species. The Public Lands Conservation Planning (PLCP) project selected 60 focal species for the statewide assessment. The PLCP project used potential habitat models to create statewide potential habitat maps for each species. Models were created using relevant available data. The base layer for all models was the FWC 2003 landcover data. Staff selected additional data layers such as the species range, soils, land use, etc., based on the natural history of the species. As such, each model is species specific. Once statewide potential habitat maps were available, a population viability analysis was conducted for each focal species.



Brown-headed nuthatch at AWMA, FWC

Using the statewide landcover based habitat maps of the 60 focal species, models identified 12 species and 1 focal species group (the wading birds) of the 60 focal species as having potential habitat on AWMA (Table 14). In addition to the species modeled to occur on the area, three additional species were identified as occurring or having the potential to occur on AWMA: the southeastern American kestrel, red-cockaded woodpecker, and the fox squirrel. To create more accurate area-specific potential habitat maps, we used the same statewide model for each focal species on the area but replaced the landcover data with area-specific natural community data.

Table 14. WCPR Focal Species Identified as Having Potential Habitat on AWMA

Common Name	Scientific Name
Bachman's sparrow	<i>Peucaea aestivalis</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Florida black bear	<i>Ursus americanus floridanus</i>
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>
Fox squirrel	<i>Sciurus niger</i>
Gopher frog	<i>Lithobates capito</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Gray bat	<i>Myotis grisescens</i>
Northern bobwhite	<i>Colinus virginianus</i>
Red-cockaded woodpecker	<i>Picoides borealis</i>
Reticulated flatwoods salamander	<i>Ambystoma bishopi</i>
Southeastern American kestrel	<i>Falco sparverius pa</i>
Southeastern bat	<i>Myotis austroriparius</i>
Southern bald eagle	<i>Haliaeetus leucocephalus</i>
Wading birds	Multiple species

For comprehensive information regarding monitoring and specific management actions for the focal species of AWMA, please refer to the WCPR Species Management Strategy for AWMA ([Appendix 13.10](#)). Any measurable objectives contained within the Strategy are included in Section 6.2 of this Management Plan.

5.5 Exotic and Invasive Species Maintenance and Control

The FWC will continue efforts to control the establishment and spread of Florida Exotic Pest Plant Council (FLEPPC) Category I or II plants on AWMA. Control technologies may include mechanical, chemical, biological, and other appropriate treatments. Treatments utilizing herbicides will comply with instructions found on the herbicide label and employ the Best Management Practices for their application.

Exotic and invasive plant species known to occur on the AWMA and treated annually by the FWC include Chinaberry, mimosa, tung oil tree, Chinese tallow, and Japanese climbing fern. Exotic and invasive plant species have been identified as occurring at varying densities comprising approximately 170 infested acres of the AWMA. However, the FWC's methodology for determining the number of acres "infested" with invasive exotic plants only represents a cumulative acreage, and does not reflect the degree of the invasive exotic occurrence. The degree of infestation among areas identified with invasive exotic plant occurrences often varies substantially by species, level of disturbance, environmental conditions, and the status of ongoing eradication and control efforts. The FWC will continue to focus treatments on areas identified as having invasive exotic plant

occurrences, as well as treating any new occurrences as they are identified through continued monitoring.

Over 2,905 individual stems of Chinese tallow, 356 Chinaberry trees, 58 tung oil trees, and 174 mimosa stems were treated on AWMA in Fiscal Year 2013-14. Additionally, 903 acres were surveyed and treated for Japanese climbing fern by area staff. Further control of Japanese climbing fern by contractors was funded through the FWC Upland Invasive Exotic Plant Management Program (UIEPMP) with contractors surveying and treating an additional 514 acres. A tabulation of exotic plant species documented on the area is provided in Table 6.

Additionally, the FWC will continue efforts to control the introduction of exotic and invasive species, as well as pests and pathogens, on the AWMA by inspecting any vehicles and equipment brought onto the area by contractors and requiring that they be free of vegetation and dirt. If vehicles or equipment used by contractors are found to be contaminated, they will be referred to an appropriate location to clean the equipment prior to being allowed on the area. This requirement is included in every contract for contractors who are conducting any operational or resource management work on the area. In this way, the FWC implements a proactive approach to controlling the introduction of exotic pests and pathogens to the area.

Feral hogs are an exotic animal species of concern on the AWMA. These animals have high



Feral hog at AWMA, FWC

reproductive rates, and when populations reach high densities, feral 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 feral hog control measures as necessary. Hog populations are controlled by hunts during the archery, general gun, and muzzleloading gun seasons. Trapping is another measure that may

be implemented to augment ongoing feral hog control efforts and to further reduce the natural community damage and degradation caused by this species. Exotic faunal species documented on the area are listed in Table 12.

5.6 Public Access and Recreational Opportunities

5.6.1 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 (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 ADA¹² where:

1. Compliance will cause harm to cultural or historic sites, 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.

5.6.2 Recreation Master Plan

The FWC has adopted a comprehensive approach to the planning and administration of fish and wildlife resource based public outdoor recreational opportunities for AWMA. To accomplish this, the FWC will work with recreational stakeholders and the general public to develop a Recreation Master Plan for AWMA that will be used to further design and develop appropriate infrastructure that will support the recreational use of the area by the general public. This Recreation Master Plan will include planning for parking, trail marking, and area resource interpretation.

5.6.3 Public Access Carrying Capacity

Baseline carrying capacities for users on 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 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 and develop public access, wildlife viewing, and fish and wildlife resource based 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 AWMA can currently support 448 visitors per day.

However, 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 in order to protect the natural and cultural resources on AWMA and to ensure that visitors will have a high-quality visitor experience. The public access

carrying capacity will be periodically reevaluated, and additional capacity may be contemplated as part of the Recreation Master Plan development and implementation process.

5.6.4 Wildlife Viewing

The AWMA provides a wide variety of native wildlife species, both resident and seasonally migratory, that are available for visitors' enjoyment for observation and photography. The quality of habitat found on the AWMA attracts a suite of species including various birds, mammals, reptiles, and amphibians throughout the AWMA. The area's outstanding wildlife habitats, including managed wildlife openings and food plots, support significant populations of both rare and common wildlife. County Road 271 bisects much of Zone A, providing easy access for wildlife viewing year-round. As noted above, the AWMA is part of the Great Florida Birding and Wildlife Trail. The AWMA is a particularly good location for viewing raptors, woodpeckers, flycatchers, waterfowl, and wading birds.

5.6.5 Hunting

The AWMA currently offers limited entry hunting opportunities for deer, turkey, small game, dove, waterfowl, and wild hogs. Special youth hunting opportunities are also offered. Hunting opportunities are offered during archery, general gun, muzzleloading gun, quail, spring turkey, and migratory bird seasons. The greatest proportion of hunter pressure during the past 25 seasons at AWMA is attributed to deer hunters, duck hunters, quail hunters, and dove hunters, respectively. An evaluation of the hunting opportunities offered on the AWMA is performed periodically by the FWC.



White-tailed deer at AWMA, FWC

5.6.6 Fishing

Fishing is allowed at AWMA year round. The AWMA is adjacent to the western shoreline of the Chattahoochee River and Lake Seminole. Fishing is popular on some ponds in Zones A and B, on many sloughs and backwaters of the Chattahoochee River, and on Lake Seminole. The lake is nationally known for its largemouth, hybrid, striped, and white bass. Four boat landings are located off of CR 271. Numerous unimproved launch sites provide small boat access to ponds.

5.6.7 Boating and Paddling

Paddlers can launch boats on Lake Seminole and the Chattahoochee River from four boat landings located along CR 271. Visitors can explore some of the larger ponds in Zones A and B by launching small boats at one of the launch sites on the area. Interconnecting ponds provide longer paddling routes.

5.6.8 Trails – Hiking, Bicycling and Equestrian

The ACOE has specific definitions and descriptive use terms associated with their various land use identifiers. Under ACOE terms, the AWMA use is defined as “wildlife management,” which limits certain activities and public facilities that may be allowed. Designated hiking trails are not allowed on ACOE lands that are defined as wildlife management lands. Therefore, there no designated nature trails are marked or maintained on AWMA however, the unpaved road system weaves through a cross-section of habitats and is open year-round for horseback riding, bicycling and hiking. There are 26.2 miles of roads that can be utilized for these activities.

5.6.9 Camping

Currently camping is prohibited on AWMA. Nearby camping opportunities are available on Three Rivers State Park, other nearby State parks, and on areas of Lake Seminole managed by the ACOE.

5.6.10 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 following FWC website: http://myfwc.com/media/1074886/FWC_Geocache_Guidelines.pdf.

5.6.11 Environmental Education, Interpretation and Programs

Interpretive information is available on the area’s entrance kiosk. Occasionally, the AWMA is used to host field trips for nearby conferences. For example, the area was a highlighted field trip for those attending the Natural Areas Conference in Tallahassee in November of 2011. The area is also used by local native plant societies and other conservational groups. The Chipola Feather Fest birding and field tour was held at AWMA in April 2015.



Kiosk at AWMA, FWC

The FWC will continue to assess the need for conservation education and research partnership opportunities as appropriate. The FWC will continue to develop and conduct

periodic conservation education and outreach programs. The FWC will continue to identify partnerships that could provide for additional conservation education programs and outreach opportunities.

5.7 Hydrological Preservation and Restoration

The hydrology of AWMA is primarily influenced by water levels at Lake Seminole, the 37,500-acre reservoir formed by closure of Jim Woodruff Dam at the confluence of the Chattahoochee and Flint Rivers. The lake and its facilities are maintained by the ACOE and is used for navigation, hydroelectric production, and recreation. The FWC will continue to cooperate with the ACOE for management of water resources on the AWMA.

5.7.1 Hydrological Assessment

The FWC will conduct or obtain an onsite hydrological and risk assessment to identify potential hydrology restoration needs. To maintain and enhance natural hydrological functions, the FWC will maintain and install low-water crossings and culverts as appropriate in coordination with the ACOE.

5.7.2 Water Resources Monitoring

Currently, the FWC cooperates with the ACOE, the NFWFMD and the DEP for ground water monitoring, including maintaining and sampling from a ground water monitoring well. In addition, the FWC will continue to cooperate with the NFWFMD, DEP and ACOE to develop and implement any necessary surface water quality and quantity monitoring protocols for AWMA. In this capacity, the FWC will primarily rely on the expertise of the NFWFMD, the DEP and the ACOE to facilitate these monitoring activities. As necessary, the FWC may independently conduct or contract for water resource monitoring, as guided by the ACOE, the DEP and the NFWFMD.

5.8 Forest Resource Management

Timber management on AWMA is a cooperative program between the FWC and the ACOE and is utilized to increase wildlife and plant diversity and as a tool to promote and restore native vegetative communities. All revenue generated from timber harvests goes to the ACOE. Beginning in 1997, approximately 1,500 acres of predominately longleaf pine stands were identified for thinning. Stands were then grouped into 10, approximately 150 acre parcels, to be thinned at a rate of one per year. Selected stands were thinned to 50-70 ft² of basal area per acre with approximately 10% of the total area converted to openings from 0.25 to 1.5 acres in size. This was to be completed on a 10 year rotation.

In Fiscal Year 2007-08 it was determined that the scope of timber thinning operations on AWMA was not sufficient in meeting management objectives, therefore a more aggressive and detailed approach was proposed. The FWC completed a timber thinning recommendation and prescription in 2008. The recommendation identified 1,364.5 acres requiring thinning. The attributes of the delineated stands, and the prescriptions for

thinning each stand were recorded. The recommendation was initiated in 2010 and 804.7 acres have been thinned since. Approximately 279.8 acres are currently marked for thinning and an additional 279.8 acres are scheduled for thinning by the end of Fiscal Year 2015-16. An 11.1 acre parcel of upland pine previously thinned in 2012-13 was strategically planted with 400 longleaf pine tubelings to supplement the relatively low number of scattered mature longleaf and supplant the harvested loblolly pine and oaks. The ACOE provided the tubelings and worked with FWC staff to plant the trees in May, 2014. Timber resources include some pine plantations in need of thinning for habitat improvement. Thinning of the forest over-story, hydrological restoration and reintroduction of prescribed burning are the most important factors in re-establishment of natural communities and the enhancement of wildlife habitats in these areas. Upland pine forest planted with off-site pines will be reforested with longleaf pine or other on-site species as appropriate. Degraded or disturbed bottomland hardwood sites will be encouraged to reforest naturally with native wetland oaks, hardwoods, and other appropriate native plant species.

Pursuant to OBVM management goals, the FWC will continue to manage timber resources for wildlife benefits and natural community restoration. Management activities including the use of timber thinning and harvesting may be utilized. The primary management technique for encouraging reforestation is 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 will be protected to benefit cavity-nesting species. The management of timber resources will be considered in the context of the overall land management goals and activities.

5.8.1 Timber Management Plan

The ACOE has management authority of timber resources within AWMA. If the ACOE determines a comprehensive Timber Management Plan is needed, the FWC will cooperate with the ACOE to develop a Timber Management Plan.

5.9 Cultural and Historical Resources

As described above, the ACOE retains authority over the management and protection of all cultural and historical resources at AWMA (Appendix 13.7). The FWC will continue to be guided by and cooperate with the ACOE's procedures for the management of cultural resources. Furthermore, as appropriate and necessary, the FWC will contact ACOE cultural resource specialists for assistance prior to any ground-disturbing activity on AWMA.

The DHR Master Site File indicates there are 85 archaeological sites and one historic cemetery on AWMA. The ACOE considers 29 sites occurring on the area as significant and

are also monitored biennially by their archaeologist in addition to the annual monitoring. The FWC will submit subsequently located cultural sites on AWMA to the ACOE and to DHR for inclusion in their Master Site File.

5.10 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 resource based 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 AWMA include (Figures 15 and 16):

- Staff residence
- FWC office
- Workshop and compound (three storage sheds, four pole barns, and the compound fence)
- Hunter check station
- 10 primitive boat launches and one improved boat ramp
- 26.2 miles of road
- One entrance kiosk
- Designated entrance sign at check station and at the intersection of Rock Pond Road and River Road



Check station at AWMA, FWC

Approximately 14 miles of area roads are publicly accessible and open to motorized vehicles. The remaining 12.2 miles of roads are used for access by FWC staff and for non-motorized access by the public. The FWC maintains the paved boat ramp on Zone A (Figure 15) while the remaining paved boat ramps depicted in Figure 16 are maintained by Jackson County. As described in Section 5.6.1 of this Management Plan, for any public facilities that are developed on areas managed by FWC, every effort is made to comply with the Americans with Disabilities Act (Public Law 101-336). Additionally, the FWC requires approval from the ACOE for construction activities which may require an Environmental Assessment or Environmental Impact Statement in accordance with their regulations.

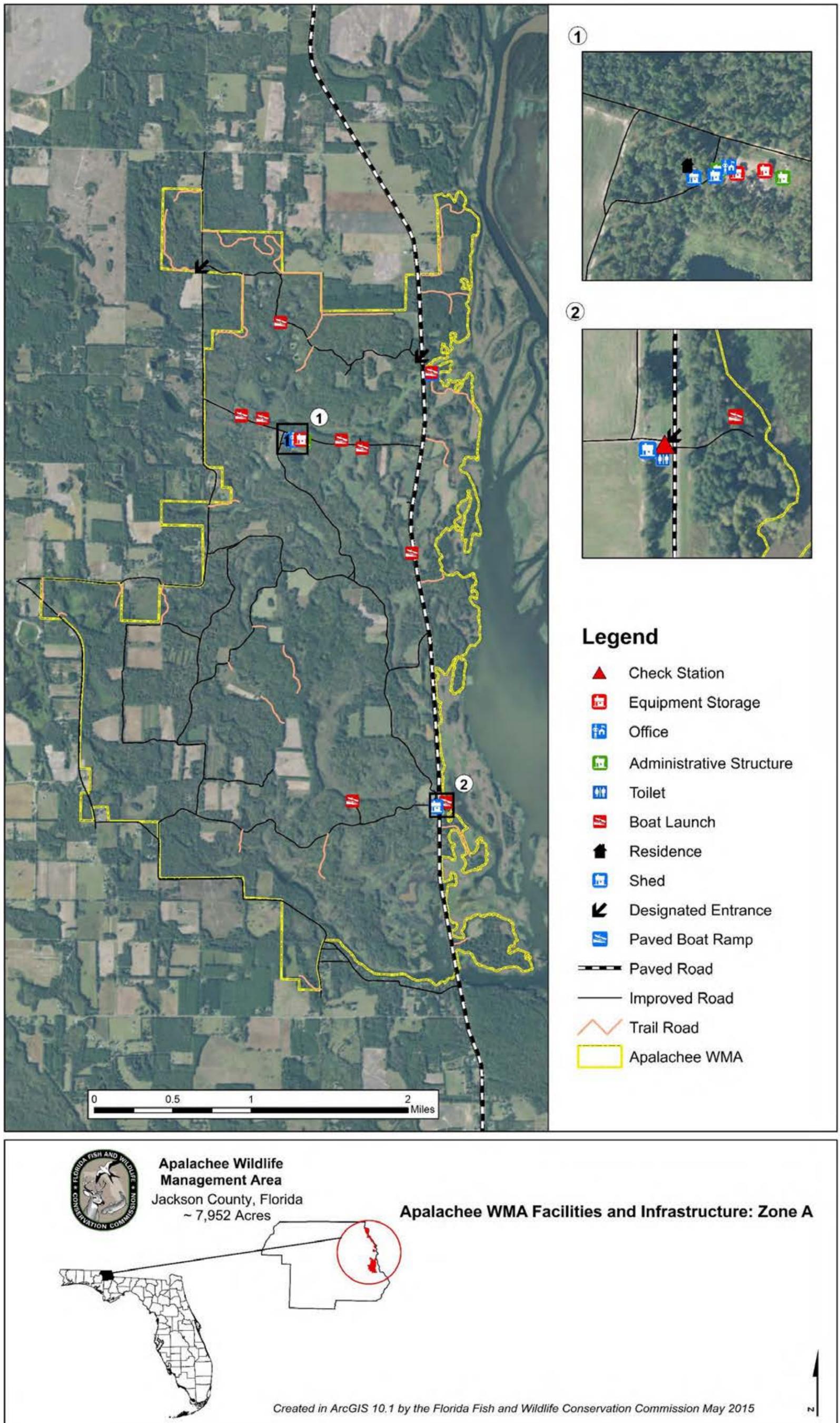


Figure 15. Facilities and Infrastructure: Zone A

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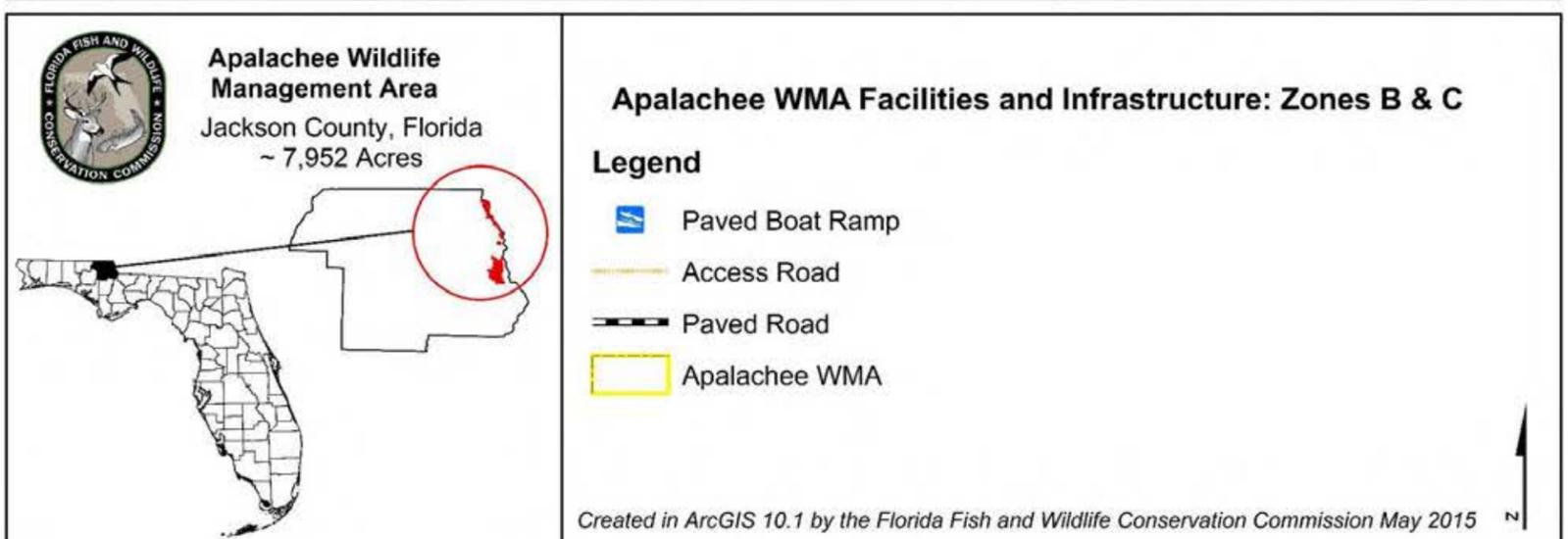
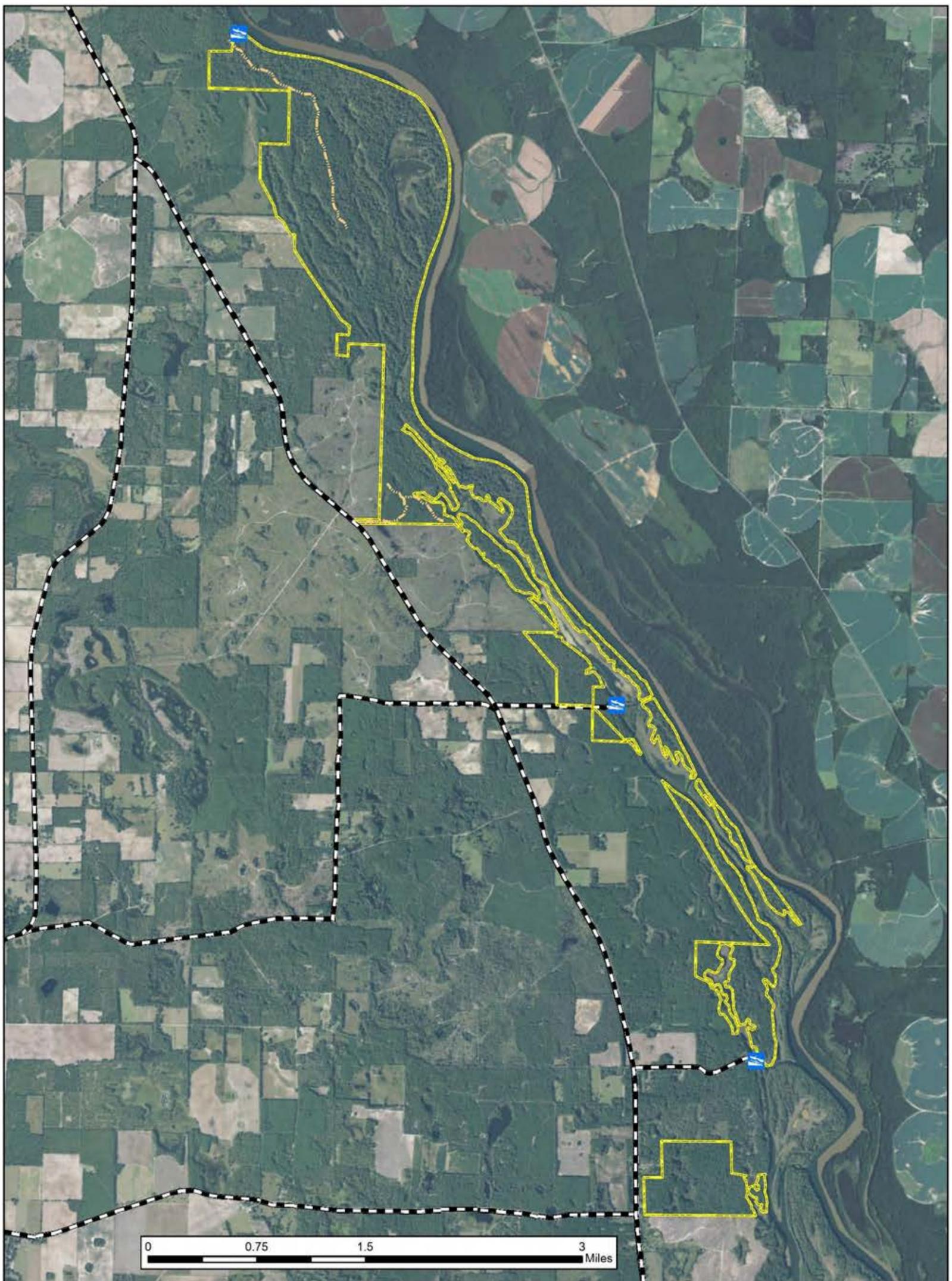


Figure 16. Facilities and Infrastructure: Zones B and C

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5.11 Land Conservation and Stewardship Partnerships

The FWC utilizes a three-tiered approach to identifying, acquiring or otherwise protecting important conservation lands adjacent to or in proximity to existing FWC-managed areas. This involves development of an Optimal Resource Boundary (ORB), Optimal Conservation Planning Boundary (OCPB) and associated Conservation Action Strategy (CAS).

Increasingly, cooperative land steward partnership efforts with private landowners plays an integral role in this effort as does ongoing land conservation, either through fee-simple or less-than-fee conservation easements. In combination, this tiered model helps the FWC to further the regional conservation of important fish and wildlife habitats through a proactive, comprehensive, and cooperative approach towards conservation.

5.11.1 Optimal Resource Boundary

This three tiered model begins with the development of an ORB, which is a resource-based analysis on a regional scale that integrates important FWC conservation research and analysis into practical planning, acquisition, and management efforts through GIS analysis. The ORB focuses on critical and important wildlife species or habitat considerations such as rare and imperiled species habitat within a particular region or ecosystem-like area on a landscape scale within which an FWC managed area is contained while eliminating urban areas or lands that have already been conserved or protected.

5.11.2 Optimal Conservation Planning Boundary

The second tier is known as the OCPB (Figure 17). The OCPB combines the regional natural resources identified in the ORB, as well as regional and local area conservation planning, including habitat conservation and restoration, habitat linkages, management challenges, land use and zoning issues, infrastructure including roads and developments, improving access, eliminating inholdings, providing prescribed burn buffers, resolving boundary irregularities, water resource protection, and conserving other important natural and cultural resources.

The OCPB provides the basis for development of a broader CAS for AWMA. Although the OCPB provides the basis for potential future voluntary, willing-seller conservation acquisitions, it is designed to function primarily as a conservation planning boundary. The OCPB identifies surrounding lands and natural resources that may be important to the continued viability of fish and wildlife populations in the region. As they are currently managed, these lands appear to contribute to regional conservation and may support conservation landscape linkages.

5.11.3 Conservation Action Strategy

The CAS is the third tier, and implements the results of the ORB and OCPB tiers. This element of the process incorporates the conservation planning recommendations into an action strategy that prioritizes conservation needs. The CAS is integral to the development of conservation stewardship partnerships and also implements the current approved

process for establishing the FWC Florida Forever Inholdings and Additions acquisition list.

Primary components of the CAS may include:

- FWC Landowner Assistance Program
- FWC conservation planning
- FWC Additions and Inholdings Program Land Conservation Work Plan
- Forest Stewardship Program proposals
- Florida Forever project proposals and boundary modifications
- Conservation easements
- Federal or State grant conservation proposals
- Regional or local conservation proposals
- Local, state, and federal planning proposals
- Non-governmental organization conservation proposals

Continued conservation of these lands may be aided by available voluntary landowner stewardship programs, conservation easements, and in some cases, potential voluntary conservation acquisitions. Participation in any FWC conservation effort is entirely voluntary and at the sole choice of willing landowners.

Private landowners seeking assistance with habitat management will likely find it offered within FWC's Landowner Assistance Program (LAP). The FWC employs biologists who are available to provide wildlife-related assistance with land-use planning and habitat management. There are many forms of assistance that include technical, financial, educational, and various forms of recognition that seek to award landowners who manage their wildlife habitat responsibly. More information on FWC's LAP program and online habitat management tools are available online at: <http://myfwc.com/conservation/special-initiatives/lap/> .

5.11.4 FWC Florida Forever Additions and Inholdings Acquisition List

Currently, there are no parcels on FWC's Florida Forever Additions and Inholdings list for AWMA. The Florida Forever projects nearest to AWMA are the Apalachicola River (six miles from AWMA) and Florida's First Magnitude Springs-Jackson Blue Springs (eight miles from AWMA), with 11,134 and 2,065 acres remaining to be acquired within these projects, respectively. Upon completion of the CAS, additions to the FWC Florida Forever Additions and Inholdings acquisition list may be recommended.

5.12 Research Opportunities

The FWC intends to cooperate with researchers, universities, and others as feasible and appropriate. For AWMA, the FWC will continue to assess and identify research needs, and pursue research and environmental education partnership opportunities as appropriate. Research proposals involving the use of the area are evaluated on an individual basis. In

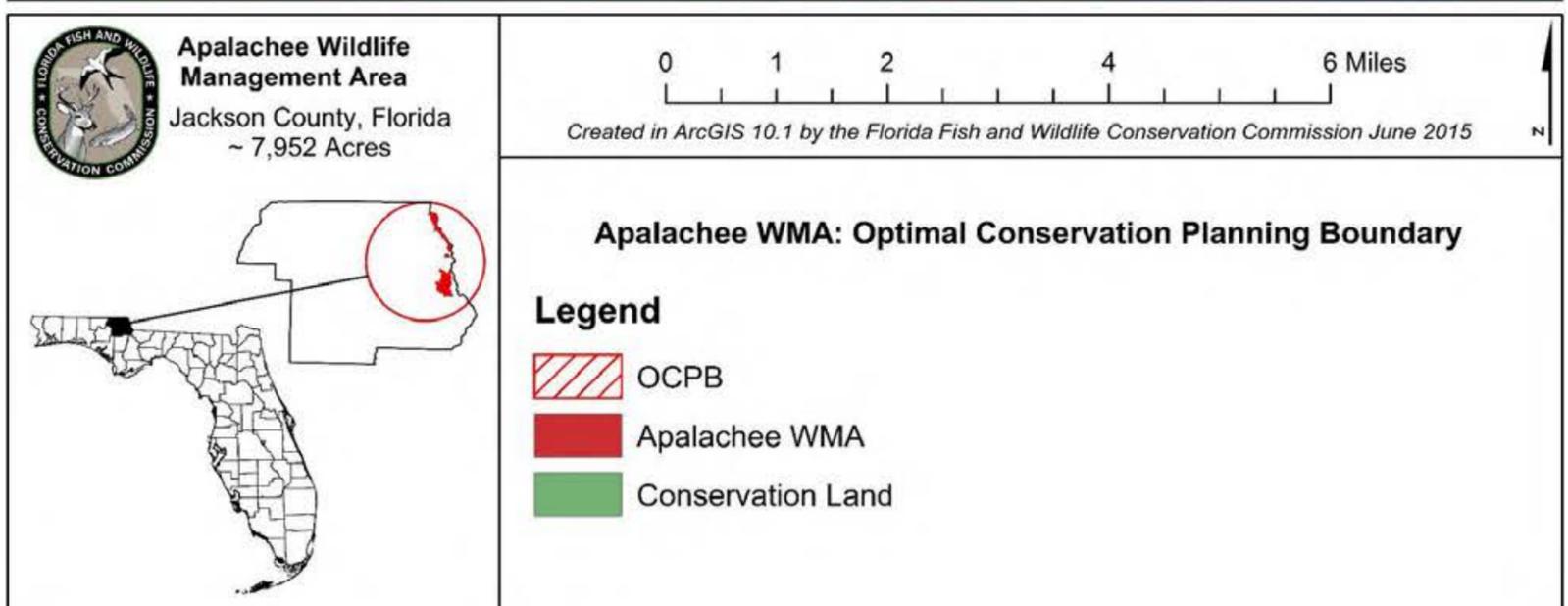
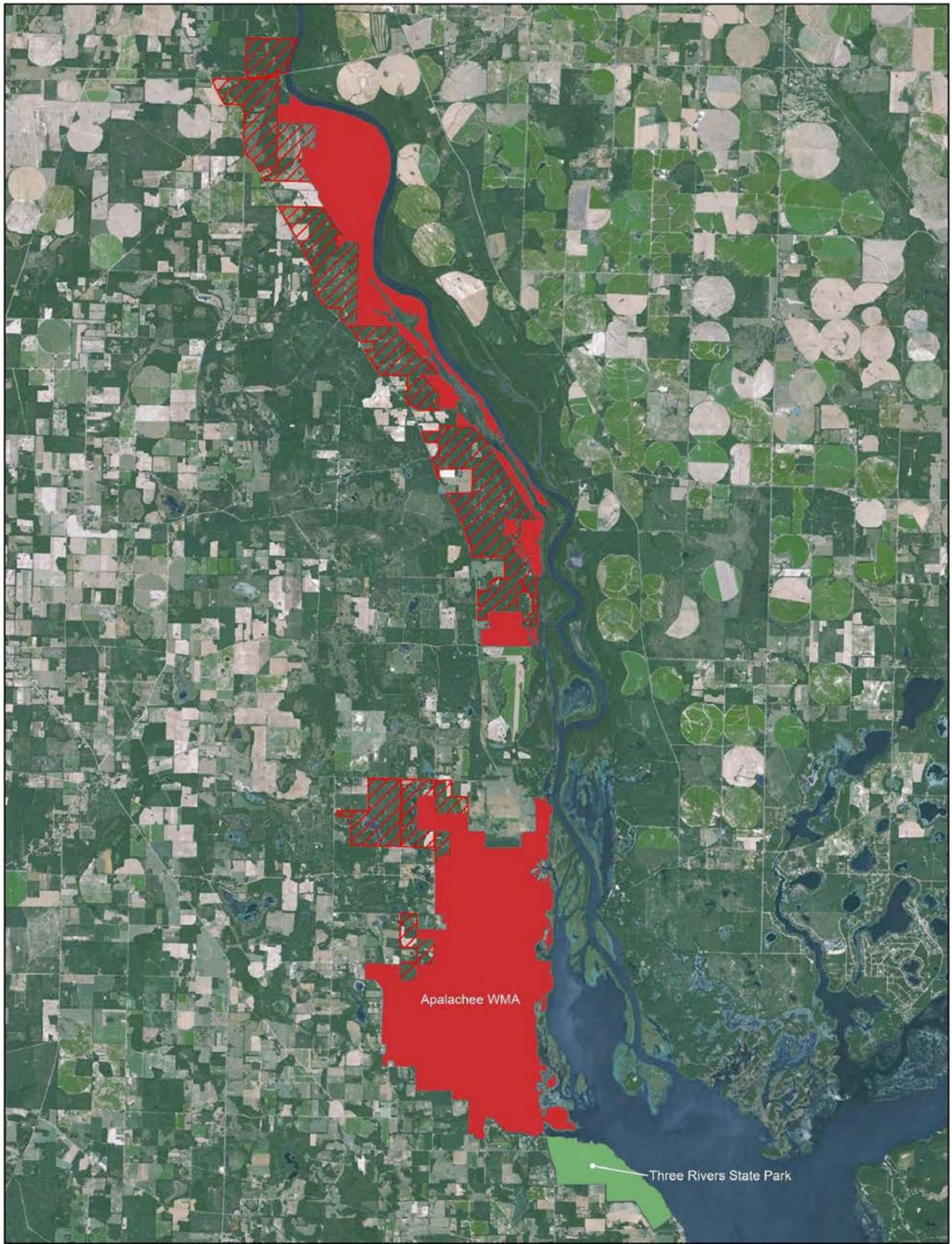


Figure 17. AWMA: Optimal Conservation Planning Boundary
Florida Fish and Wildlife Conservation Commission | Apalachee WMA Management Plan

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the past, the AWMA has been used by researchers from Harvard University and the Ohio State University for field mice, and caterpillar and moth collection, respectively. All research activities on AWMA must have prior approval by the FWC.

5.13 Cooperative Management and Special Uses

5.13.1 Cooperative Management

The FWC is responsible for the overall management and operation of AWMA as set forth in the license agreement with the ACOE, with the exception of timber resources and cultural resources. In keeping with the license agreement, and in order to conduct 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. The FWC cooperates and consults with the NFWFMD and the DEP for the monitoring and management of both ground and surface water resources and the overall management of AWMA.

The FWC is a signatory in a Memorandum of Understanding (MOU) establishing the Apalachicola Regional Stewardship Alliance (ARSA), a public/private landowner collaboration seeking to address the conservation needs of the Apalachicola River corridor, barrier islands, and hundreds of thousands of acres of longleaf pine and wiregrass habitats in northwest Florida (Appendix 13.11). The Goals of ARSA are to protect, restore and manage lands that will sustain the high biodiversity of the region; and increase the fire management capacity of all Partners. The MOU also provides for the sharing of information concerning land management and ecosystem restoration techniques. Other signatories to the MOU are the DEP, the Florida Forest Service, Department of Defense (DOD), The Nature Conservancy (TNC), the NFWFMD, the USFWS, the U.S. Forest Service (USFS), the Bureau of Land Management, and the National Interagency Prescribed Fire Training Center.

5.13.2 Agricultural Fields

In accordance with the ACOE license agreement with the FWC, a percentage of the AWMA is retained in agricultural fields to maintain traditional agricultural use of the lands. Therefore, the FWC administers many farming agreements and contracts for the AWMA (Appendix 13.4). Forty-nine agricultural fields, ranging in size from 2.4 to 26.4 acres, comprise a total of 525.6 acres in management Zone A.



Field at AWMA, *David Moynahan*

Twenty-one (227 acres) of these fields are leased to local farmers under a long-term sharecrop contract at no-cost. Fifteen fields (169 acres) were allocated for a revenue contract lease. All seed, lime, fertilizer, labor, and equipment are supplied by the

contractors and they are required to till fields yearly as directed by FWC personnel in order to keep the fields in early successional plant species. Plantings are restricted to crops approved by the FWC (generally peanuts, corn, wheat, peas, or soybeans) and 10% of the yield is required to be left standing for wildlife. The number of fields and acreage planted varies with the market demand, weather, and constraints placed on peanut production (generally a 3 year rotation). Several of the fields have low fertility, deep sandy soils, and are planted only when crop prices are high.

Contractors planted a total of 396 acres in Fiscal Year 2013-14 comprised of 268.6 acres of soybeans, 121.3 acres of peanuts, and 6.1 acres of corn. Area personnel have sole responsibility for agronomic activities on the remaining 13 fields ranging in size from 3.1 to 26.4 acres, totaling 129.6 acres. These fields are planted primarily in small grains such as benne, grain sorghum, and corn to provide a supplemental food source for quail, deer, and to serve as dove fields.

5.13.3 First Responder and Military Training

First-responder (public governmental police department or agency, fire and emergency medical service personnel) training and military training are conditionally allowed on 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 AWMA, and causes no measurable long-term impact to the natural resources of the area. Additionally, FWC staff must be notified and approve the training through issuance of a permit prior to any such training taking place on AWMA. Any first-responder or military training that is not low-impact, intermittent and occasional would require an amendment to this management plan and approval by the ACOE. Therefore, the plan would be submitted by the FWC to the ACOE, the DSL and the ARC for approval consideration prior to authorization.

Additionally, the Gulf Regional Air Space Initiative (GRASI) is a continuation of ongoing, mutually beneficial cooperation among the DOD and its military branches, including the United States Air Force (USAF), State and regional agencies, on issues related to military readiness and conservation. The GRASI was initiated to prepare for the addition to the regional airspace (Northwest Florida) of the Joint Strike Fighter (F-35), as well as additional training needs of air and ground units of the military. The GRASI's primary purpose for FWC-managed lands is to allow important military ground training activities on areas where related ground-support air activities can also be safely conducted, and thereby relieve congestion in other restricted airspaces.

The FWC participates in GRASI along with a consortium of military, state and regional agencies (FWC, Department of Agriculture and Consumer Services, NFWFMD, DEP, TNC, Department of Economic Opportunity, USFS, National Park Service, DOD and USAF). The GRASI consortium of agencies have worked to assess and recognize mutually compatible

areas for training that minimize adverse impacts to natural resources and public recreational opportunities. As a result of this effort, the FWC has identified and provided to the military a list of FWC-managed lands with potential for GRASI training areas. To further determine the suitability of the recommended FWC-managed areas, the FWC and military personnel will coordinate site visits for areas of interest.

In addition, a GRASI Memorandum of Agreement (MOA; Appendix 13.12) between the FWC and the USAF was developed and signed by the FWC. Similar MOAs between other GRASI consortium entities and the USAF have also been developed and enacted. In general, the FWC GRASI MOA outlines management responsibilities and activities of the participating entities that are considered compatible among all parties and that are not expected to unreasonably impact the managed lands. The GRASI MOA further calls for FWC and USAF personnel to work cooperatively to develop an “Annual Operations Plan.”

To advance our shared national and State interests, the FWC will continue to coordinate and cooperate with the USAF, other branches of the military, and other GRASI consortium members to achieve the goals of GRASI, and fulfill the commitments established in the FWC GRASI MOA. As with first-responder and other training described above, GRASI-related military training activities that are not low-impact, intermittent and occasional would require an amendment to this management plan, and therefore will be submitted by the FWC to the DSL and the ARC for approval consideration and prior to authorization. However, since all of AWMA is owned by the ACOE, any first responder and military training proposed for the area will also require the approval of the ACOE.

5.13.4 Apiaries

Currently, there are no apiaries operating on AWMA. However, use of apiaries is conditionally approved for AWMA and is deemed to be consistent with purposes for acquisition, is in compliance with the Conceptual State Lands Management Plan, and is consistent with the FWC agency mission, goals, and objectives as expressed in the agency Strategic Plan and priorities document (Appendix 13.8). Location, management, and administration of apiaries on AWMA will be guided by the FWC Apiary Policy (Appendix 13.13). An apiary site assessment according to the FWC Apiary Policy was completed in October 2011 and no suitable apiary sites were identified for AWMA.

5.14 Climate Change

Because of Florida’s unique ecology and topography, any potential impacts as a result of climate change may be particularly acute and affect multiple economic, agricultural, environmental, and health sectors across the state. The impact of climate change on wildlife and habitat may already be occurring, from eroding shorelines and coral bleaching to increases in forest fires and saltwater intrusion into inland freshwater wetlands.

The Intergovernmental Panel on Climate Change (IPCC), a multi-national scientific body,

reports that climate change is likely proceeding at a rate where there will be unavoidable impacts to humans, wildlife, and habitat. Given current levels of heat-trapping greenhouse gas emissions, shifts in local, regional, and national climate patterns including changes in precipitation, temperature, increased frequency and intensity of extreme weather events, rising sea levels, tidal fluctuations, and ocean acidification are projected. The current trend of global temperature increase has appeared to accelerate in recent decades, and continued greenhouse gas emissions may result in projected global average increases of 2 –11.5° F by the end of the century.¹³

This apparent change in global climate has the potential to disrupt natural processes; in some areas, climate change may cause significant degradation of ecosystems that provide services such as clean and abundant water, sustainable natural resources, protection from flooding, as well as hunting, fishing and other recreational opportunities. Consequently, climate change is a challenge not only because of its likely direct effects, but also because of its potential to amplify the stress on ecosystems, habitats, and species from existing threats such as exponential increases in surface and ground water use, habitat loss due to increased urbanization, introduction of invasive species, and fire suppression.

Potential impacts that may be occurring as a result of climate change include: change in the timing of biological processes, such as flowering, breeding, hibernation, and migration;^{14, 15,} ¹⁶ more frequent invasions and outbreaks of exotic invasive species;¹⁷ and loss of habitat in coastal areas due to sea level rise.¹⁸ Some species are projected to adjust to these conditions through ecological or evolutionary adaptation, whereas others are projected to exhibit range shifts as their distributions track changing climatic conditions. Those species that are unable to respond to changing climatic conditions are projected to go extinct. Some estimates suggest that as many as 20% - 30% of the species currently assessed by the IPCC are at risk of extinction within this century if global mean temperatures exceed increases of 2.7 – 4.5° F.¹⁹ A number of ecosystems are projected to be affected at temperature increases well below these levels.

At this time, the potential effects of climate change on Florida's conservation lands are just beginning to be studied and are not yet well understood. For example, the FWC has begun a process for currently developing climate change adaptation strategies for monitoring, evaluating, and determining what specific actions, if any, may be recommended to ameliorate the projected impacts of climate change on fish and wildlife resources, native vegetation, and the possible spread of exotic and invasive species. Currently, the FWC is continuing its work on the development of these potential adaptation strategies. However, as noted above, the effects of climate change may become more frequent and severe within the time period covered by this Management Plan.

For these reasons, there is a continuing need for increased information and research to

enable adaptive management to cope with potential long-term climate change impacts. The most immediate actions that the FWC can take are to work with partners to gather the best scientific data possible for understanding natural processes in their current state, model possible impacts and subsequent changes from climate change, develop adaptive management strategies to enhance the resiliency of natural communities to adapt to climate change, and formulate criteria and monitoring for potential impacts when direct intervention may be necessary to protect a species. To this end, when appropriate, the FWC will participate in organizations such as the Peninsular Florida Land Conservation Cooperative or similar organizations so that the FWC continues to gain understanding and share knowledge of key issues related to potential climate change. In addition, the FWC will consider the need for conducting vulnerability assessments to model the potential effects of climate change, especially sea level rise and storm events, on imperiled species and their habitats on FWC managed land.

Elements of climate change that may potentially affect AWMA include more frequent and more potent storm events, alteration of vegetation reproductive cycles, and changes in the fire regime. To address the potential impacts of climate change on the AWMA, Goals and Objectives have been developed as a component of this Management Plan (Section 6.13). Depending on the recommendations of the adaptive management strategies described above, additional specific goals and objectives to mitigate potential climate change impacts may be developed for the AWMA Management Plan in the future.

5.15 Soil and Water Conservation

Soil disturbing activities will be confined to areas that have the least likelihood of experiencing erosion challenges (see Section 2.1.2 and Figures 4 and 5 AWMA-Soils). 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.

6 Resource Management Goals and Objectives

The management goals described in this section are considered broad, enduring statements designed to guide the general direction of management actions to be conducted in order to achieve an overall desired future outcome for 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. Many of the objectives listed have specific end-of-the-calendar-year target dates for completion and all of them are classified as having either short-term (less than two years) or long-term (up to ten years) timelines for completion.

6.1 Habitat Restoration and Improvement

Goal: Improve extant habitat and restore disturbed areas.

Short-term

- 6.1.1 Prescribe burn 1,200 acres of fire-adapted communities per year.
- 6.1.2 Maintain 3,468 acres (upland pine, sandhill, upland mixed woodland and some early successional ruderal and abandoned agricultural fields) within a one-three year target fire return interval and 60-70% of the upland natural communities (sandhill and upland pine) within a one-two fire return interval.
- 6.1.3 Implement the area's prescribed burning plan.
- 6.1.4 Conduct habitat/natural community improvement and restoration on 25 acres per year using mechanical and chemical vegetation control techniques including Brown-tree cutting, mulching (Gyro-trac or Bobcat), and various herbicide treatments.
- 6.1.5 In cooperation with the ACOE, conduct timber harvest for the purposes of habitat restoration and improvement on 585 acres (Figure 18).
- 6.1.6 Continue to implement OBVM on the area.
- 6.1.7 Maintain 8.6 miles of dedicated fire breaks annually.

Long-term

- 6.1.8 Continue to conduct prescribed burning on 1,200 acres of fire adapted communities per year.
- 6.1.9 Continue to maintain 3,468 acres (upland pine, sandhill, upland mixed woodland and some early successional ruderal and abandoned agricultural fields) within a one-three year target fire return interval and 60-70% of the upland natural communities (sandhill and upland pine) within a one-two fire return interval.
- 6.1.10 Continue to implement OBVM on the area.
- 6.1.11 Continue to conduct habitat/natural community improvement and restoration on 25 acres per year using mechanical and chemical vegetation control techniques including Brown-tree cutting, mulching (Gyro-trac or Bobcat), and various herbicide treatments.
- 6.1.12 Continue to conduct timber harvest for the purposes of habitat restoration on 1,200 acres (Figure 18).
- 6.1.13 Maintain 8.6 miles of dedicated fire breaks annually.

6.2 Imperiled and Focal Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

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

Short-term

- 6.2.1** Continue to implement the area’s WCPR Species Management Strategy for the following imperiled species, focal species, and focal species groups: Bachman’s sparrow, bald eagle, brown-headed nuthatch, Cooper’s hawk, Florida pine snake, fox squirrel, gopher frog, gopher tortoise, gray bat, northern bobwhite, southeastern American kestrel, southeastern bat, and wading birds.
- 6.2.2** As described in the WCPR Strategy, continue natural community restoration in the 286 acre northern bobwhite Strategic Management Area (SMA; Figure 18).
- 6.2.3** As described in the WCPR Strategy, continue to conduct annual fall covey surveys to determine northern bobwhite population trends over time.
- 6.2.4** As described in the WCPR Strategy, continue to work with the ACOE and the U.S. Fish and Wildlife Service (USFWS) to protect gentian pinkroot during timber harvests.
- 6.2.5** Continue to collect opportunistic imperiled wildlife and plant species occurrence data.

Long-term

- 6.2.6** Continue to implement the area’s WCPR Species Management Strategy for the following imperiled species, focal species, and focal species groups: Bachman’s sparrow, bald eagle, brown-headed nuthatch, Cooper’s hawk, Florida pine snake, fox squirrel, gopher frog, gopher tortoise, gray bat, northern bobwhite, southeastern American kestrel, southeastern bat, and wading birds.
- 6.2.7** As described in the WCPR Strategy, continue to conduct spring point counts every three years to track trends in relative abundance and distribution of Bachman’s sparrows and brown-headed nuthatches.
- 6.2.8** As described in the WCPR Strategy, continue natural community restoration in the 286 acre northern bobwhite SMA (Figure 18).
- 6.2.9** As described in the WCPR Strategy, continue to conduct annual fall covey surveys to determine northern bobwhite population trends over time.
- 6.2.10** As described in the WCPR Strategy, continue to work with the ACOE and USFWS

to protect gentian pinkroot during timber harvests.

6.2.11 Continue to collect opportunistic imperiled wildlife and plant species occurrence data.

6.2.12 By 2023, revise and update the area's WCPR Strategy.

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

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

Short-term

6.3.1 Continue to conduct annual spotlight monitoring surveys for white-tailed deer.

6.3.2 Continue to collect biological harvest data at the hunter check station to assess game population health and provide baseline information for management recommendations.

6.3.3 Continue to collect opportunistic wildlife occurrence data.

6.3.4 Continue to monitor and maintain 150 wood duck nesting boxes annually.

6.3.5 Continue annual agronomic activities on 525 acres of dedicated agricultural fields including contracts with local farmers for agricultural operations on 396 acres and management of 129.6 acres fields for food plots, dove fields, and supplemental wildlife habitat (Figure 18).

6.3.6 Continue to annually maintain and manage 100 acres of wildlife openings and/or field edges (Figure 18).

Long-term

6.3.7 Continue to conduct annual spotlight monitoring surveys for white-tailed deer.

6.3.8 Continue to collect biological harvest data at the hunter check station to assess game population health and provide baseline information for management recommendations.

6.3.9 Continue to collect opportunistic wildlife occurrence data.

6.3.10 Continue to monitor and maintain 150 wood duck nesting boxes annually.

6.3.11 Continue annual agronomic activities on 525 acres of dedicated agricultural fields including contracts with local farmers for agricultural operations on 396 acres and

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management of 129.6 acres fields for food plots, dove fields, and supplemental wildlife habitat (Figure 18).

6.3.12 Continue to maintain and manage 100 acres of wildlife openings annually (Figure 18).

6.4 Exotic and Invasive Species Maintenance and Control

Goal: Remove exotic and invasive plants and animals and conduct needed maintenance- control.

Short-term

6.4.1 Annually survey and treat at least 700 acres of EPPC Category I and Category II invasive exotic plant species, primarily targeting Japanese climbing fern and Chinese tallow as well as other species known to occur on the area including Chinaberry, mimosa, and tung oil tree.

6.4.2 Implement control measures on one exotic and nuisance animal species (feral hog) in Zones B and C if needed.

6.4.3 Continue to work with the ARSA Cooperative Invasive Species Management Areas (CISMA) to identify and control early detection and rapid response (EDRR) species that might occur on AWMA.

6.4.4 Continue to seek funding through the UIEPMP and/or other sources for invasive exotic plant control.

Long-term

6.4.5 Continue to annually survey and treat at least 500 acres of EPPC Category I and Category II invasive exotic plant species.

6.4.6 Continue to work with the ARSA CISMA to identify and control EDRR species that might occur on AWMA.

6.4.7 Continue to seek funding through the UIEPMP and/or other sources for invasive exotic plant control.

6.5 Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities.

Short-term

- 6.5.1 Maintain public access and recreational opportunities to allow for a recreational carrying capacity of 448 visitors per day.
- 6.5.2 Complete inclusion into the Great Florida Birding and Wildlife Trail program.
- 6.5.3 Continue to provide regulations brochures, recreational website, and one interpretive kiosk, and informational signage.
- 6.5.4 Continue opportunistic interpretive/education programs.
- 6.5.5 Maintain 5.6 miles of existing service roads primarily used for access by hunters/fishermen (any user) or for access to agricultural fields (Figure 18).
- 6.5.6 Maintain 10 primitive boat launches and one improved boat ramp (Figure 18).
- 6.5.7 Continue to provide hunting opportunities for deer, turkey, small game, migratory birds, and feral hogs.
- 6.5.8 Continue to provide fishing opportunities on appropriate water bodies.
- 6.5.9 Maintain 1.3 miles of waterways/canals/ditches that connect bodies of water for use by small watercraft (Figure 18).
- 6.5.10 Develop a Recreation Master Plan.
- 6.5.11 Develop the Apalachee Road Plan to characterize and inventory public access roads (primary, secondary, and unimproved roads) and service roads.
- 6.5.12 Continue to provide paddling opportunities on appropriate waterbodies.

Long-term

- 6.5.13 Implement the area Recreation Master Plan.
- 6.5.14 Maintain public access and recreational opportunities to allow for a carrying capacity of 448 visitors/day.
- 6.5.15 Monitor trails biannually for visitor impacts.
- 6.5.16 Continue to provide hunt brochures, recreational website, and one interpretive kiosk, and informational signage.
- 6.5.17 Continue opportunistic interpretive/education programs.
- 6.5.18 Continue to maintain 5.6 miles of existing service roads primarily used for access by hunters/fishermen (any user) or for access to agricultural fields (Figure 18).

- 6.5.19 Maintain 10 primitive boat launches and one improved boat ramp (Figure 18).
- 6.5.20 Reassess recreational opportunities every three years.
- 6.5.21 Continue to provide hunting opportunities for deer, turkey, small game, migratory birds, and feral hogs.
- 6.5.22 Continue to maintain 1.3 miles of waterways/canals/ditches that connect bodies of water for use by small watercraft (Figure 18).
- 6.5.23 Continue to provide fishing opportunities on appropriate waterbodies.
- 6.5.24 Continue to provide paddling opportunities on appropriate waterbodies.
- 6.5.25 Cooperate with other agency, County, stakeholders, and regional landowners to investigate regional recreational opportunities including linking hiking, and multi-use trail systems between adjacent public areas.
- 6.5.26 Continue to identify partnerships that could provide for environmental educational programs and outreach.
- 6.5.27 Develop a bird list, plant list, butterfly list, and public access facility map.
- 6.5.28 Add a kiosk at Neil's Landing on Zone B to display a location map and designated access roads for Zones B and C.

6.6 Hydrological Preservation and Restoration

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

Short-term

- 6.6.1 Maintain and enhance natural hydrological functions, install and maintain low-water crossings and culverts as appropriate.
- 6.6.2 Continue to cooperate with the NFWFMD and the DEP for the monitoring of surface and ground water quality and quantity.

Long-term

- 6.6.3 Obtain a site Hydrological Assessment to identify potential hydrology restoration needs.
- 6.6.4 To enhance natural hydrological functions, continue to install and maintain low-water crossings and culverts as appropriate.

- 6.6.5 As recommended by the Hydrology Assessment, install and maintain low-water crossings, culverts, and other structures recommended in the Assessment as appropriate to maintain and enhance natural hydrological functions.
- 6.6.6 Continue to cooperate with the NFWFMD and the DEP for the monitoring of surface and ground water quality and quantity.

6.7 Forest Resource Management

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

Short-term

- 6.7.1 Continue to cooperate and consult with the ACOE on activities relating to timber assessments and forest management as appropriate based on restoration and maintenance needs of the natural communities and other goals and objectives established for the management of AWMA.

Long-term

- 6.7.2 Continue to cooperate and consult with the ACOE on activities relating to timber assessments and forest management as appropriate based on restoration and maintenance needs of the natural communities and other goals and objectives established for the management of AWMA.

6.8 Cultural and Historical Resources

Goal: Protect, preserve and maintain cultural and historic resources.

Short-term

- 6.8.1 Continue to work with the ACOE to monitor, protect, and preserve as necessary 85 identified sites, 29 of these sites are monitored by ACOE personnel.
- 6.8.2 Ensure all known sites are recorded in the DHR Master Site file.

Long-term

- 6.8.3 Cooperate with the ACOE in designing site plans for development of infrastructure.
- 6.8.4 Continue to work with the ACOE to monitor, protect, and preserve as necessary 85 identified sites, 29 of these sites are monitored by ACOE personnel.
- 6.8.5 Coordinate with the DHR for Archeological Resource Management staff training.

6.9 Capital Facilities and Infrastructure

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

Short-term

- 6.9.1** Continue to maintain 11 facilities (boat launches, paved boat ramp, workshop and associated structures, staff residence, main entrance, check station; Figure 18).
- 6.9.2** Maintain 14.0 miles of roads used by the public for motorized vehicles; 13.6 miles classified as Level 2 roads and 0.4 miles of Level 3 roads to primitive boat launches.
- 6.9.3** Improve or repair two facilities (office/workshop compound and associated facilities) and a one-half mile of road.

Long-term

- 6.9.4** Monitor roads used as trails and infrastructure biannually for visitor impacts.
- 6.9.5** Maintain 14.0 miles of roads used by the public for motorized vehicles; 13.6 miles classified as Level 2 roads and 0.4 miles of Level 3 roads to primitive boat launches.
- 6.9.6** Continue to maintain 11 facilities (boat launches, paved boat ramp, workshop and associated structures, staff residence, main entrance, check station; Figure 18).
- 6.9.7** Improve or repair two facilities (office/workshop compound and associated facilities) and one mile of road.

6.10 Land Conservation and Stewardship Partnerships

Goal: Enhance fish and wildlife conservation, resource, and operational management through development of an optimal boundary.

Short-term

- 6.10.1** Identify potential important wildlife habitat, landscape-scale linkages, wildlife corridors, and operational/resource management needs.
- 6.10.2** Identify and develop conservation stewardship partnerships.
- 6.10.3** Identify and pursue conservation acquisition needs.
- 6.10.4** Develop and maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC OCPB and for FWC's LAP and Land Acquisition Programs.

- 6.10.5 Develop a CAS for the area.
- 6.10.6 Contact and inform adjoining landowners about the FWC LAP to pursue non-acquisition conservation stewardship partnerships.
- 6.10.7 Determine which parcels should be added to the FWC acquisition list.
- 6.10.8 Identify potential non-governmental organization partnerships and grant program opportunities.
- 6.10.9 Determine efficacy of conducting an adjacent landowner's assistance/conservation stewardship partnership workshop.
- 6.10.10 Identify potential conservation easements donations.

Long-term

- 6.10.11 To minimize fragmentation of the area, continue to identify strategic parcels to revise the completed OCPB for AWMA as appropriate and necessary.
- 6.10.12 Continue to identify and develop conservation stewardship partnerships.
- 6.10.13 Continue to identify and pursue conservation acquisition needs.
- 6.10.14 Continue to maintain a GIS shapefile and other necessary data to facilitate nominations from the FWC OCPB and for the FWC LAP and Land Acquisition Program.
- 6.10.15 Continue to identify and recommend parcels for addition to the FWC acquisition list.
- 6.10.16 Continue to pursue acquisition of parcels added to the FWC acquisition list as acquisition work plan priorities and funding allow.
- 6.10.17 As feasible, continue to periodically contact and meet with adjacent landowners for willingness to participate in the CAS, and coordinate landowner assistance/conservation stewardship partnership workshops as deemed appropriate.
- 6.10.18 Continue to identify potential conservation easements donations.

6.11 Research Opportunities

Goal: Explore and pursue cooperative research opportunities.

Short-term

- 6.11.1 Explore and pursue cooperative research opportunities through universities, Fish and Wildlife Research Institute (FWRI), etc.
- 6.11.2 Continue to cooperate with researchers, universities, and others as appropriate.
- 6.11.3 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.

Long-term

- 6.11.4 Continue to explore and pursue cooperative research opportunities through universities, FWRI, etc.
- 6.11.5 Continue to cooperate with researchers, universities, and others as appropriate.
- 6.11.6 Continue to assess the need for and pursue research and environmental education partnership opportunities as appropriate.

6.12 Cooperative Management and Special Uses

Goal: Provide access and use of AWMA for cooperative management and special uses and continue collaborative management efforts.

Short-term

- 6.12.1 Continue to administer contracts for the use of agricultural fields at AWMA.
- 6.12.2 Continue to cooperate with the ACOE for the overall management of AWMA.
- 6.12.3 Coordinate and cooperate with DOD military branches to allow for training opportunities for military personnel such as GRASI and other initiatives as appropriate and compatible with the conservation of AWMA.
- 6.12.4 Coordinate and cooperate with the ACOE on any requests for first responder and other related training activities at AWMA as appropriate and compatible with the conservation of the area.

Long-term

- 6.12.5 Continue to administer contracts for the use of agricultural fields at AWMA.
- 6.12.6 Continue to cooperate with the ACOE for the overall management of AWMA.
- 6.12.7 Coordinate and cooperate with DOD military branches to allow for training opportunities for military personnel such as GRASI and other initiatives as appropriate and compatible with the conservation of AWMA.

6.12.8 Continue to coordinate and cooperate with the ACOE on any requests for first responder and other related training activities at AWMA as appropriate and compatible with the conservation of the area.

6.13 Climate Change

Goal: Develop appropriate adaptation strategies in response to projected climate change effects and their potential impacts on natural resources, including fish and wildlife, and the operational management of the AWMA.

Short-term

6.13.1 Coordinate with FWC-FWRI Climate Change Adaptation Initiative to identify potential impacts of projected climate change on fish and wildlife resources and operational management of the AWMA.

Long-term

6.13.2 Continue to coordinate with FWC-FWRI Climate Change Adaptation Initiative to identify potential impacts of projected climate change on fish and wildlife resources and operational management of the AWMA.

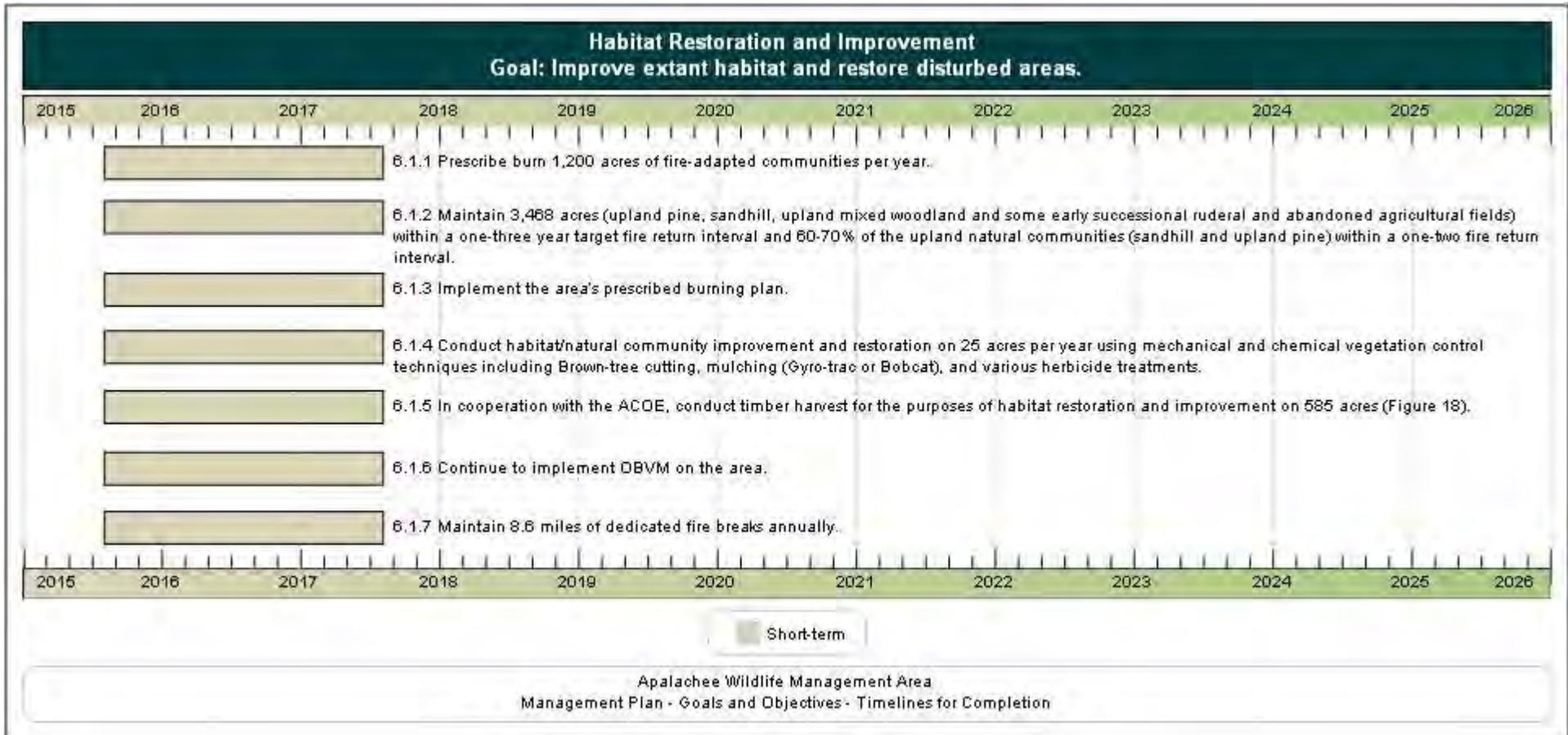
6.13.3 Incorporate appropriate climate change adaptation strategies into the WCPR for the AWMA.

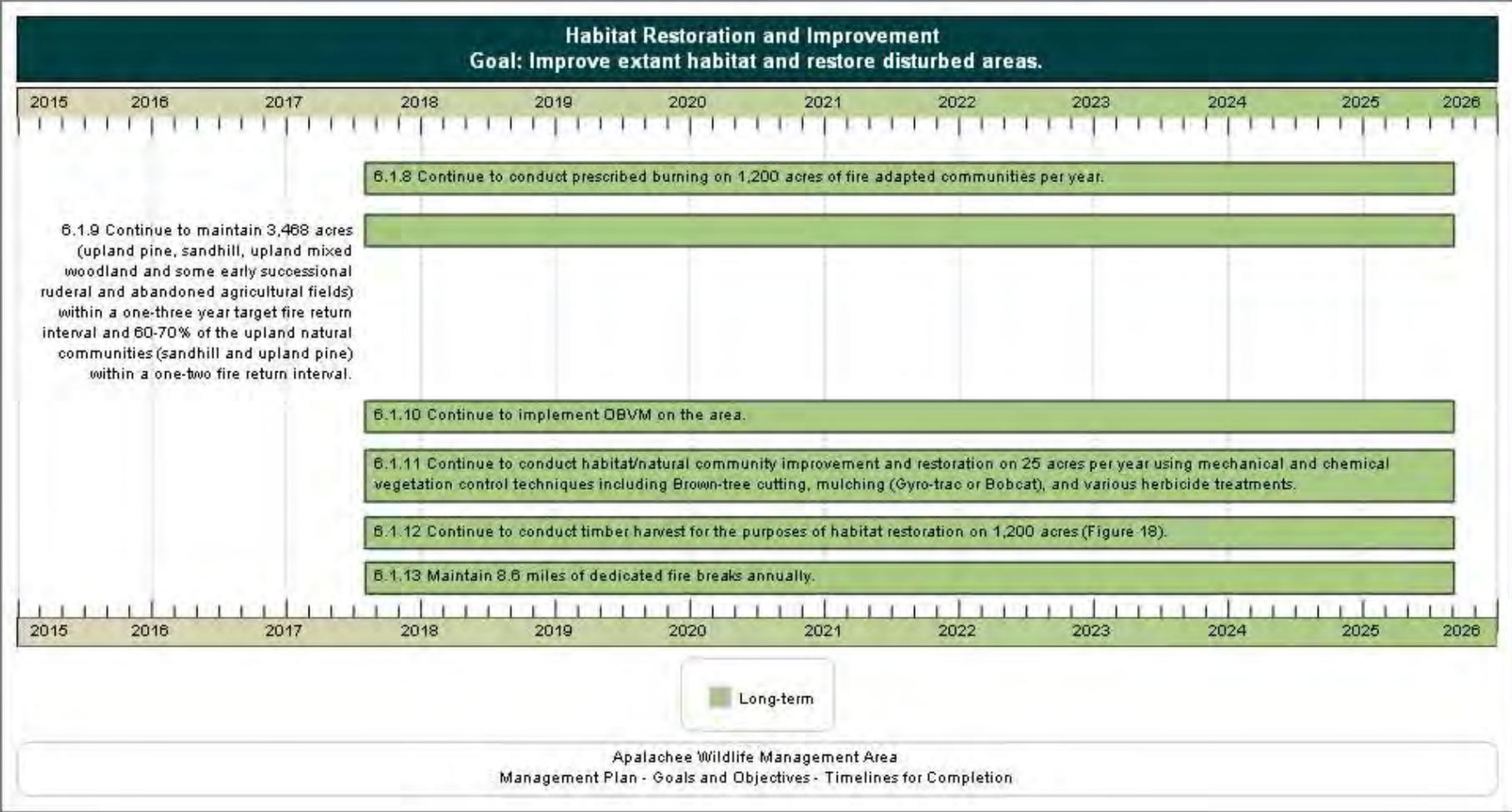
6.13.4 As appropriate, update the AWMA Prescribed Fire Plan to incorporate new scientific information regarding projected climate change, such as increased frequency of drought, on the fire regime of AWMA's fire-adapted habitats.

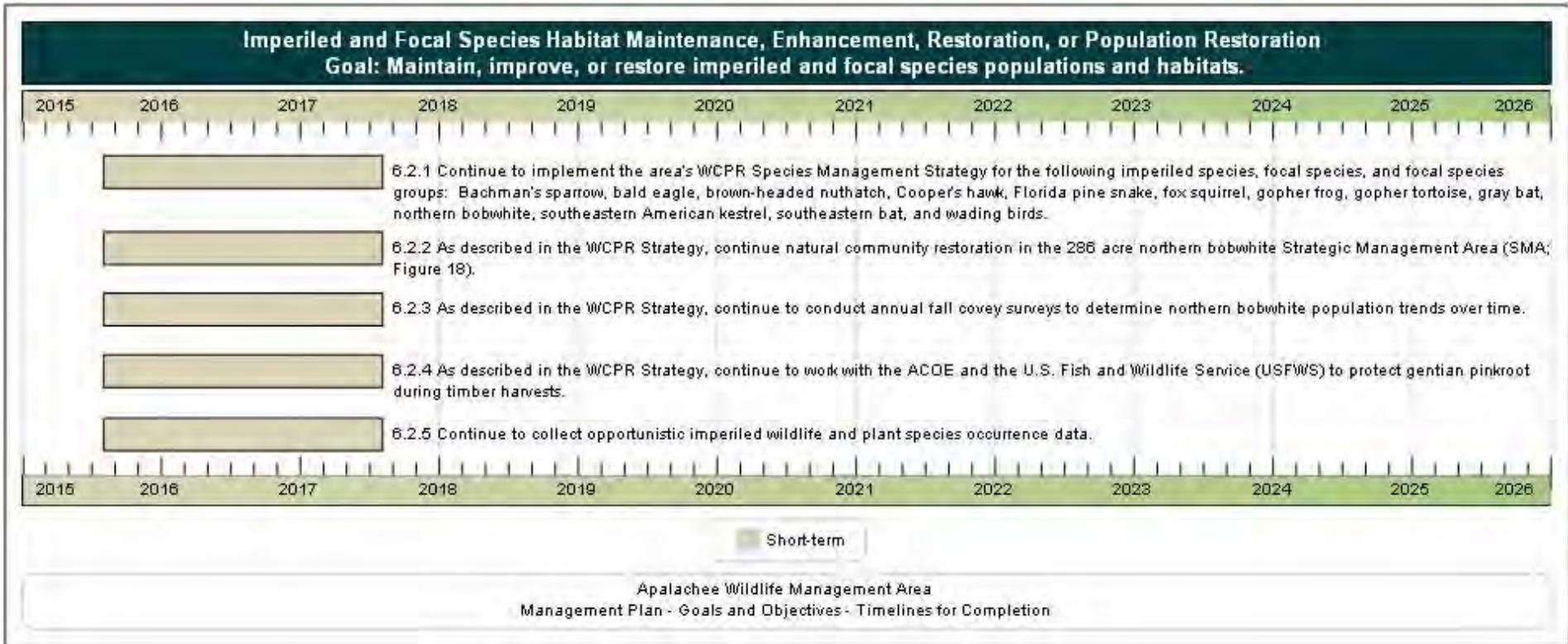
6.13.5 As science, technology, and climate policy evolve, educate natural resource management partners and the public about the agency's policies, programs and efforts to study, document and address potential climate change; assess the need to incorporate public education about climate change into FWC's public education curriculum.

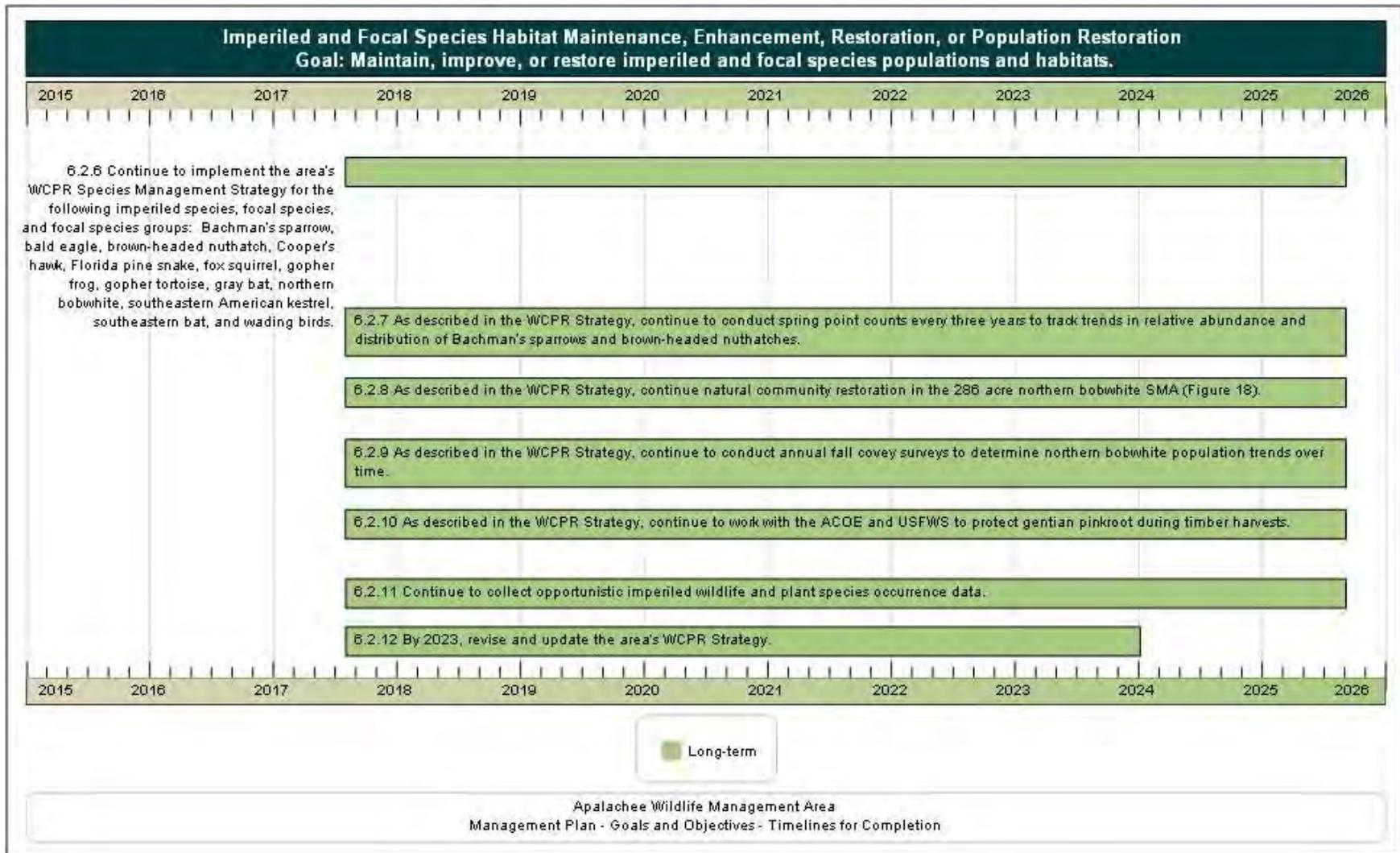
7 Schedule: Timelines for Completion of Resource Management Goals and Objectives

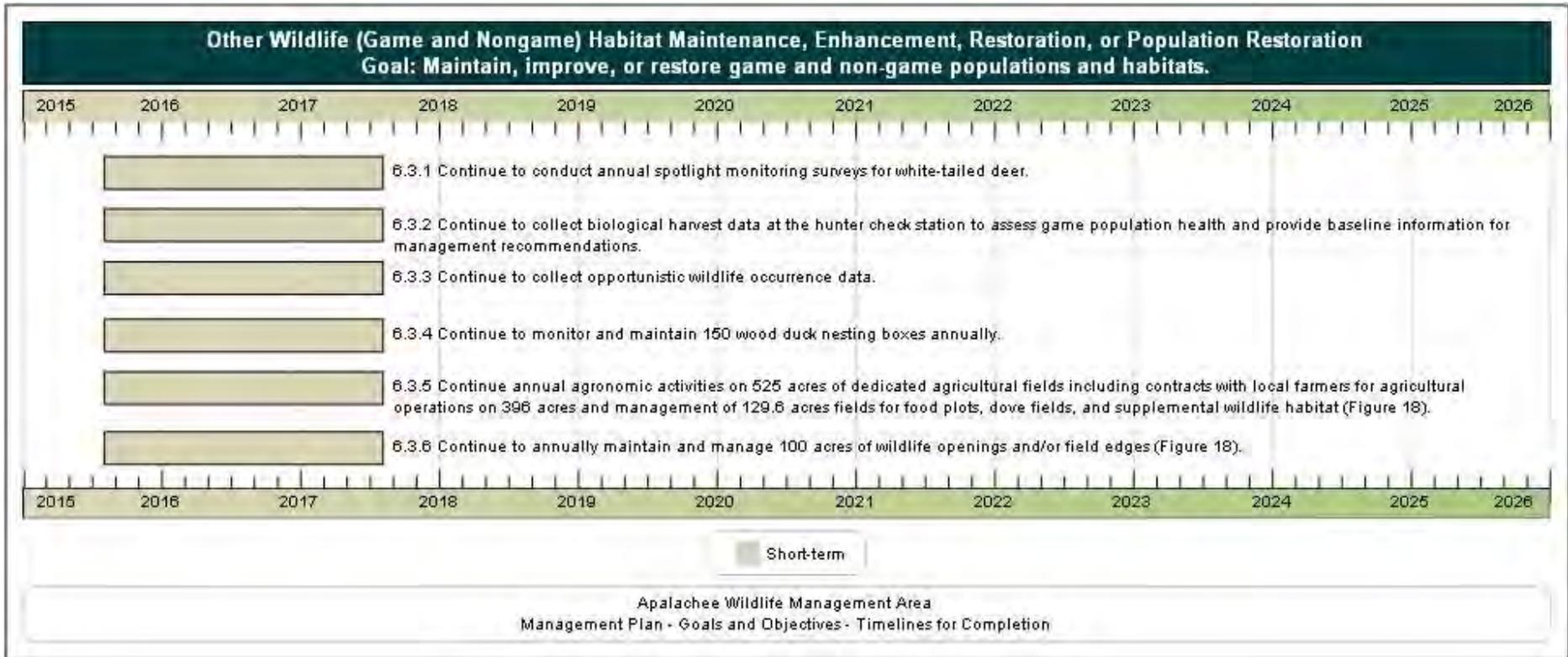
The following section presents the short- and long-term goals and objectives for the management of AWMA graphically in a timeline format. These timelines directly reflect the short- and long-term goals and objectives presented above in Section 6.

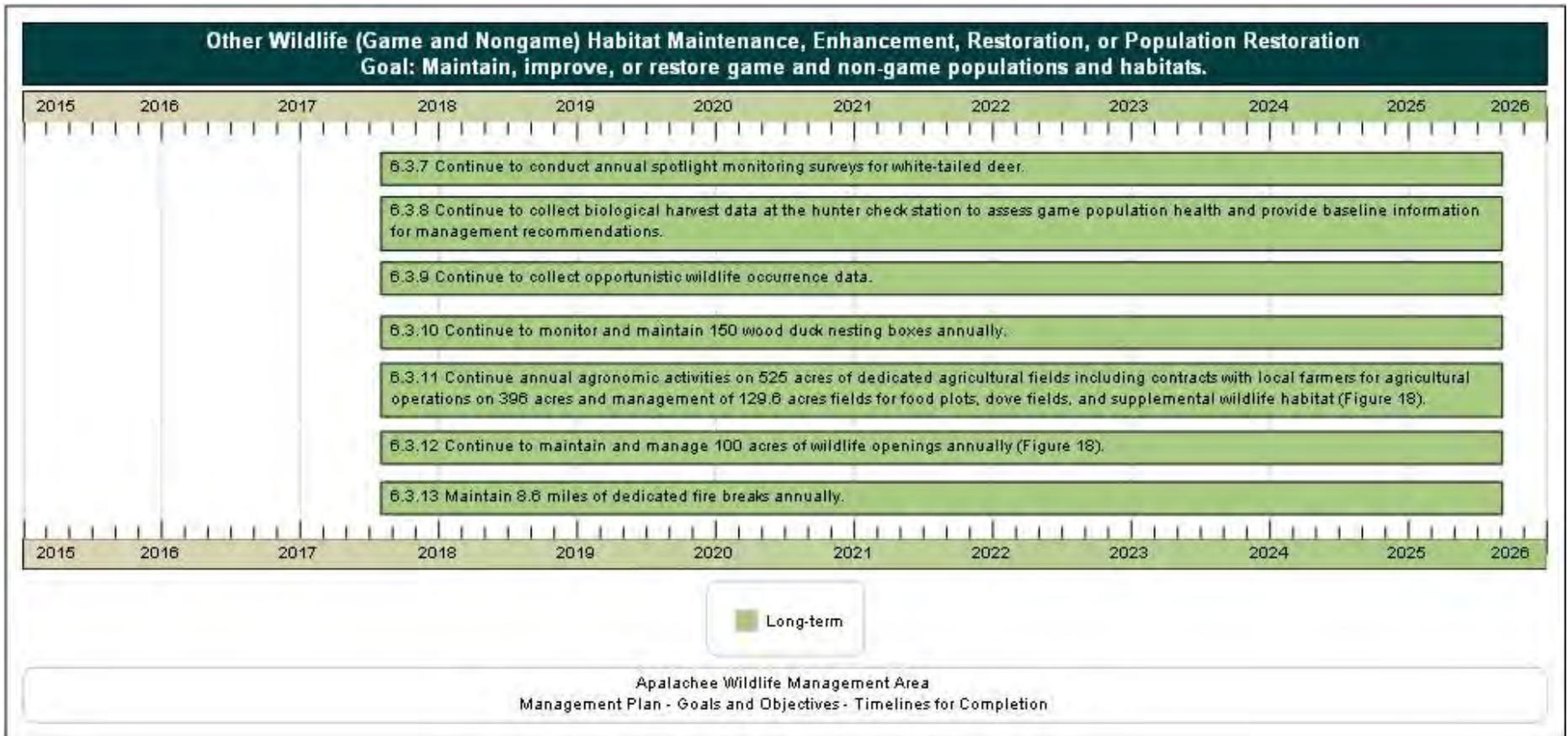


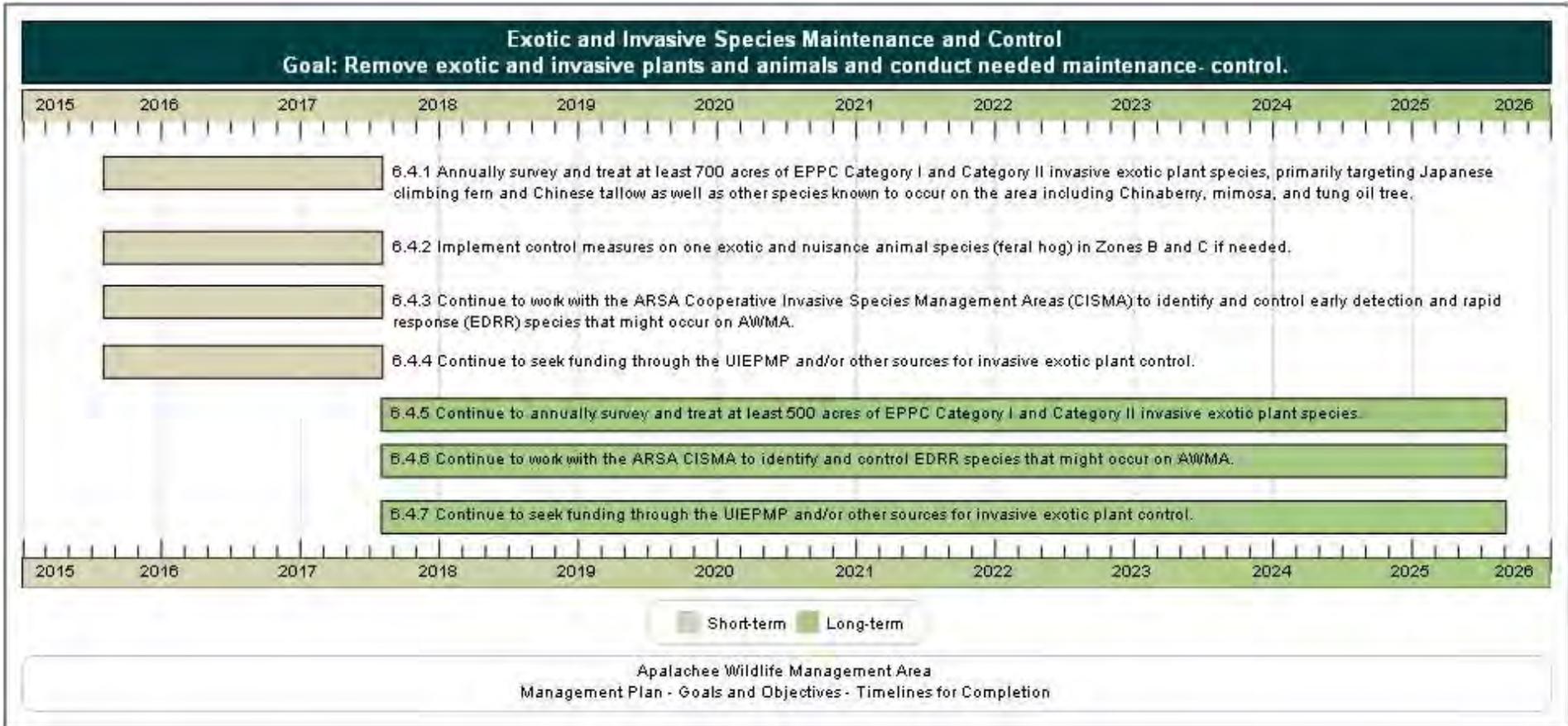


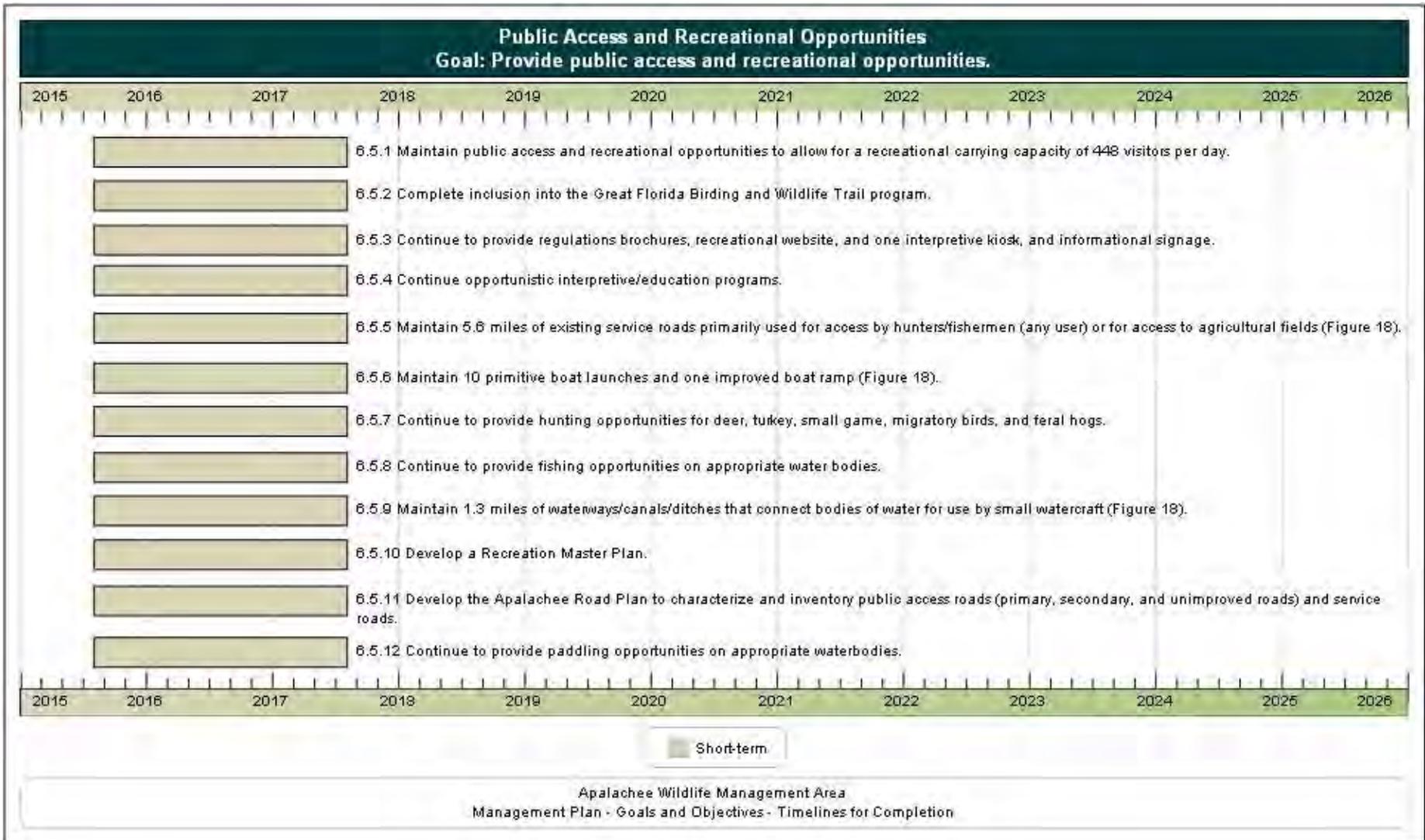




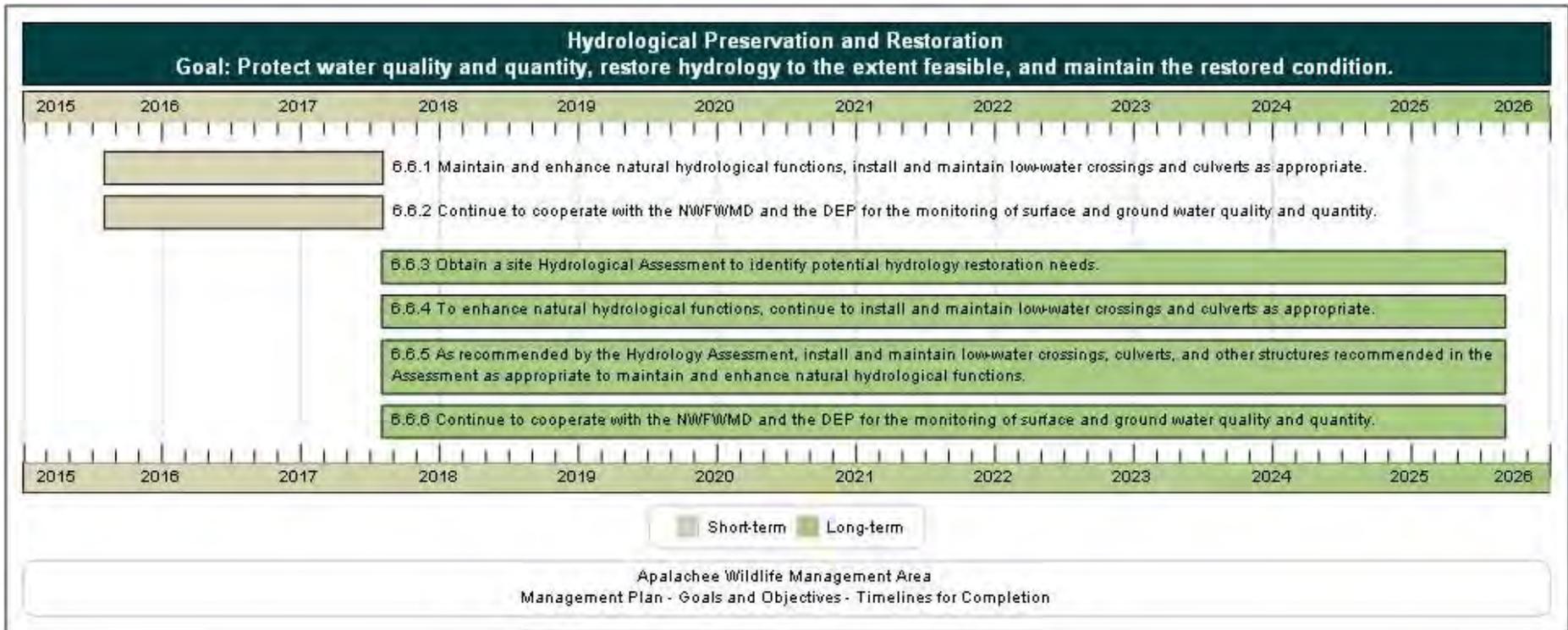


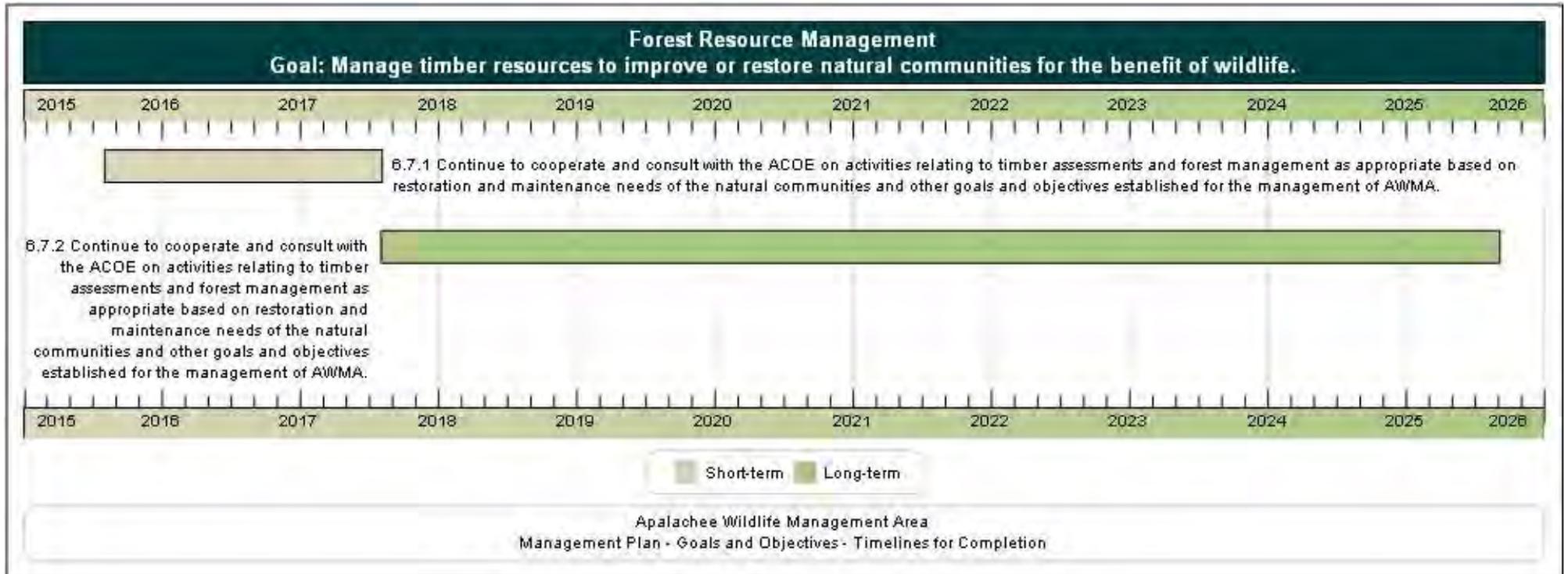


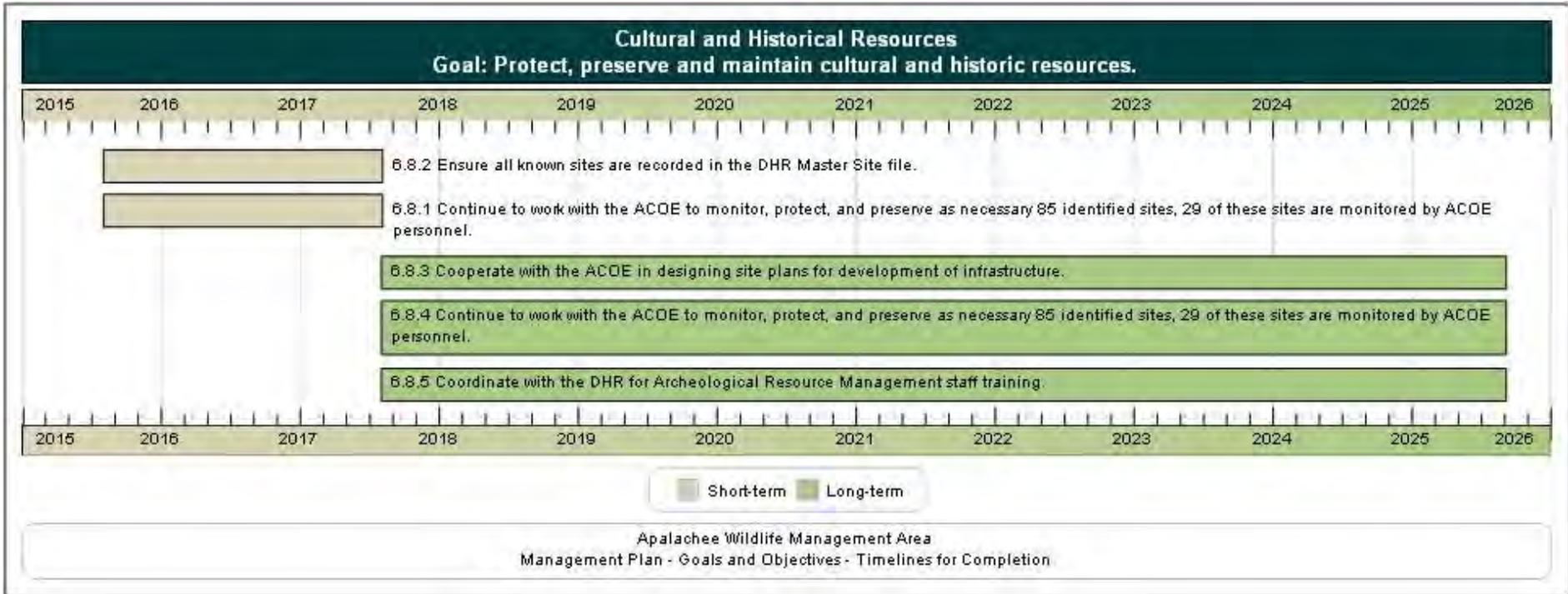






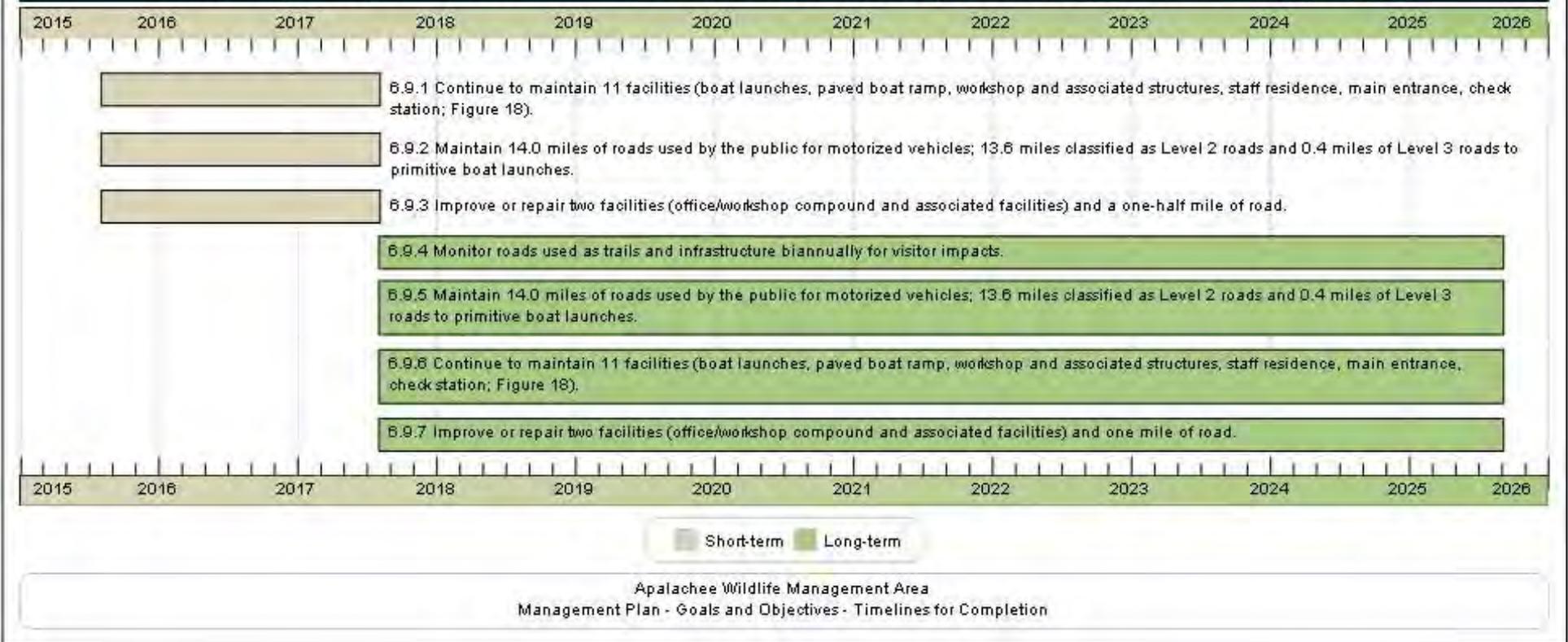


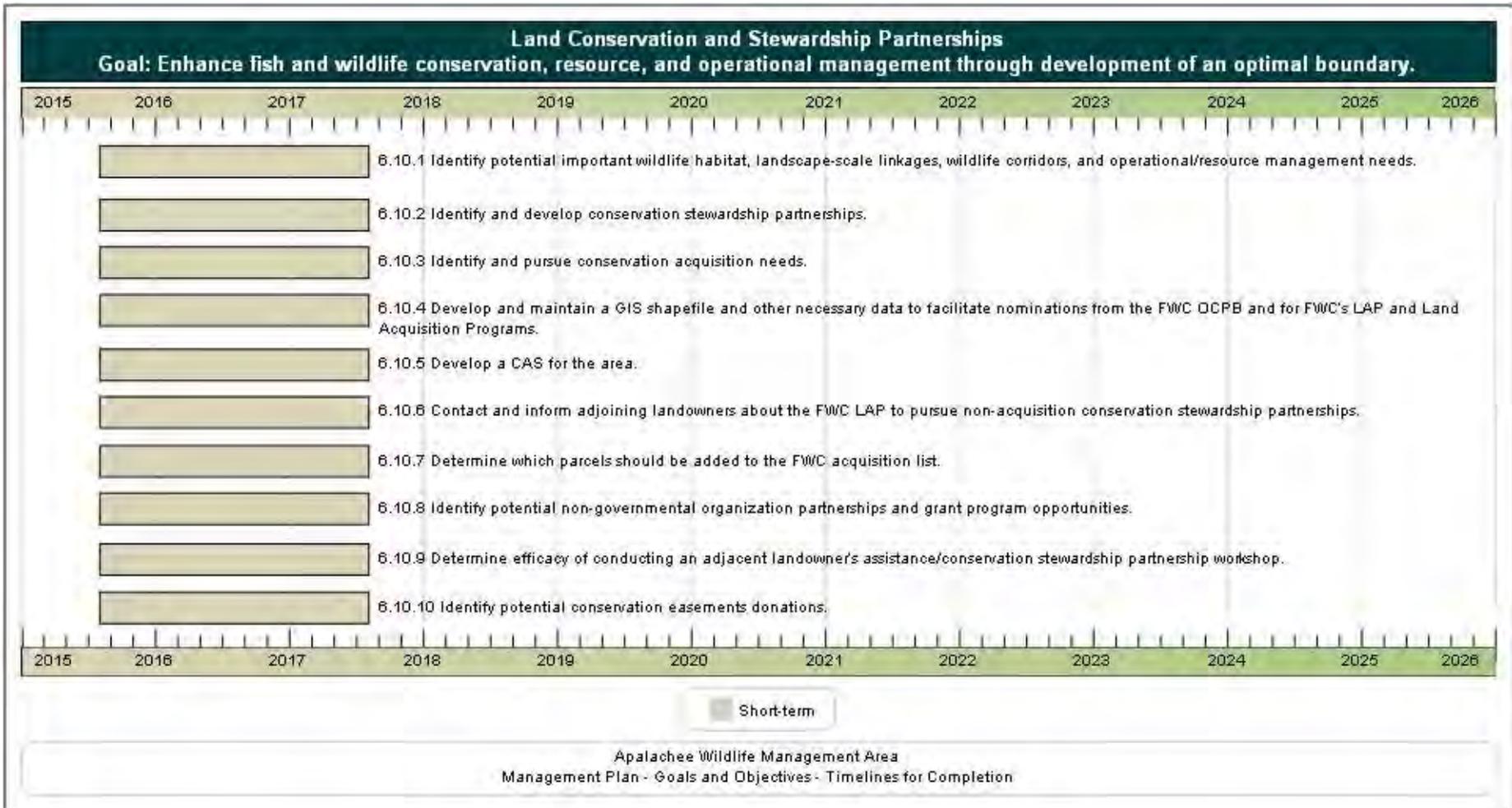


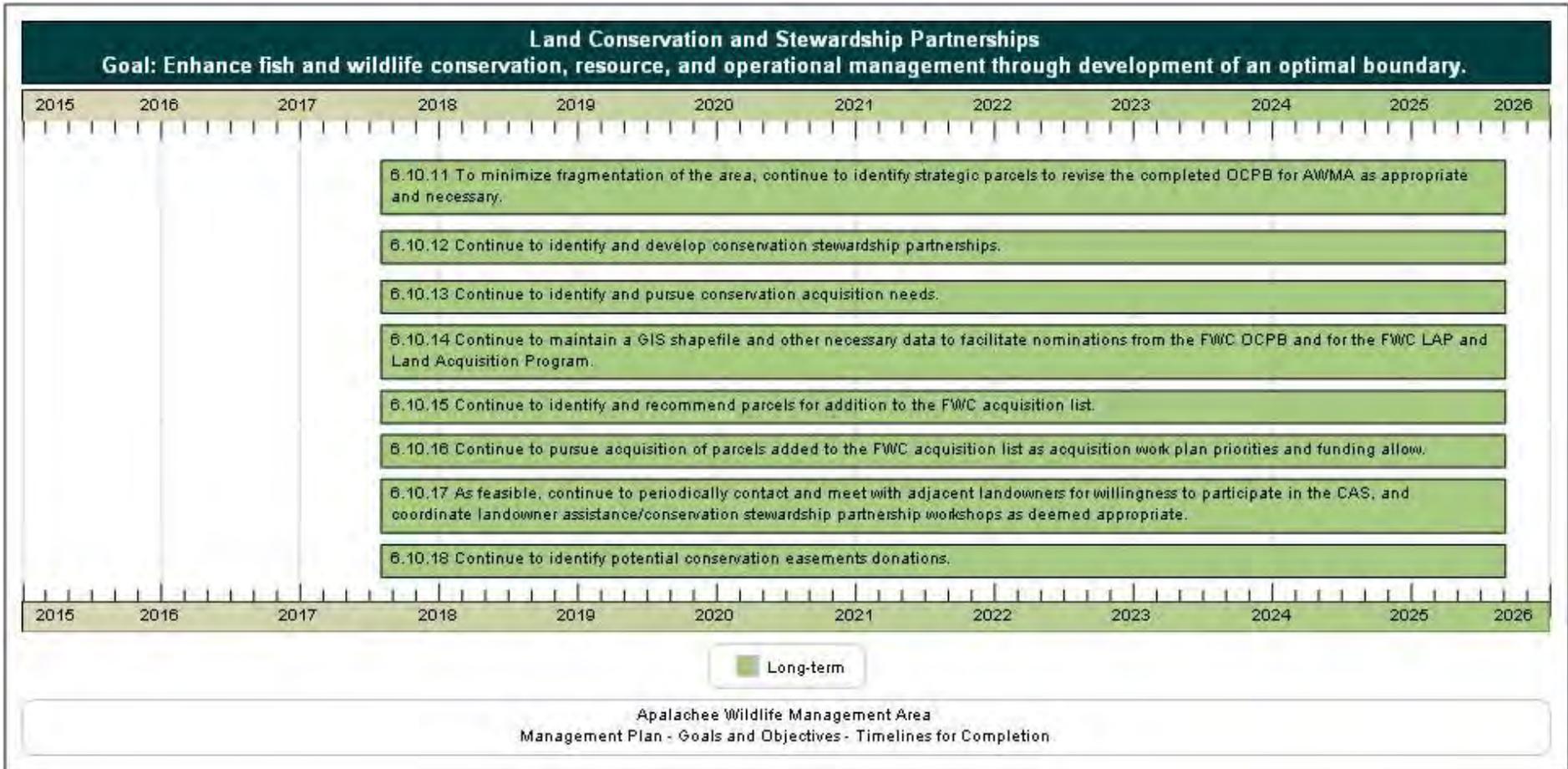


Capital Facilities and Infrastructure

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



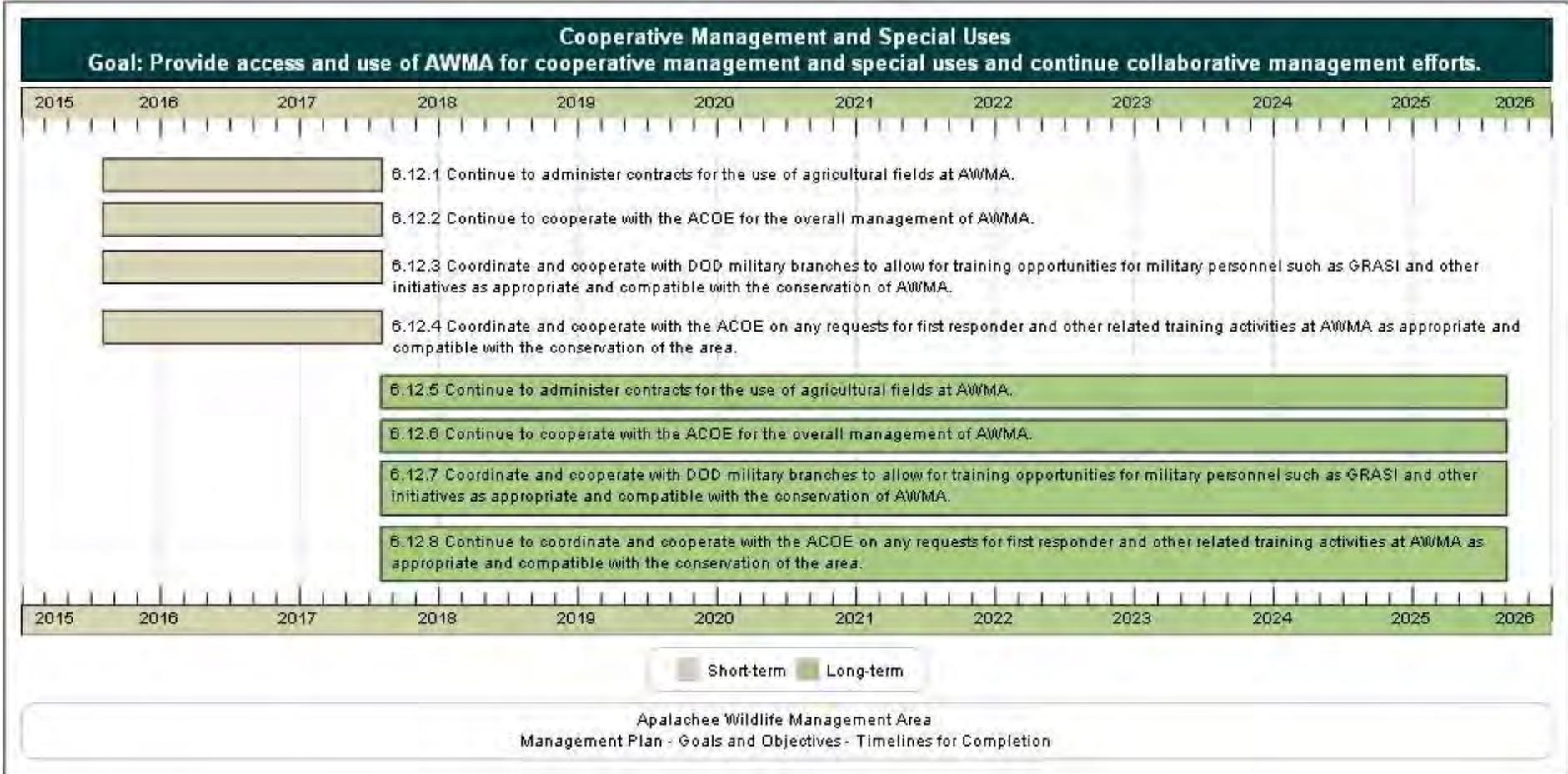




Research Opportunities
Goal: Explore and pursue cooperative research opportunities.

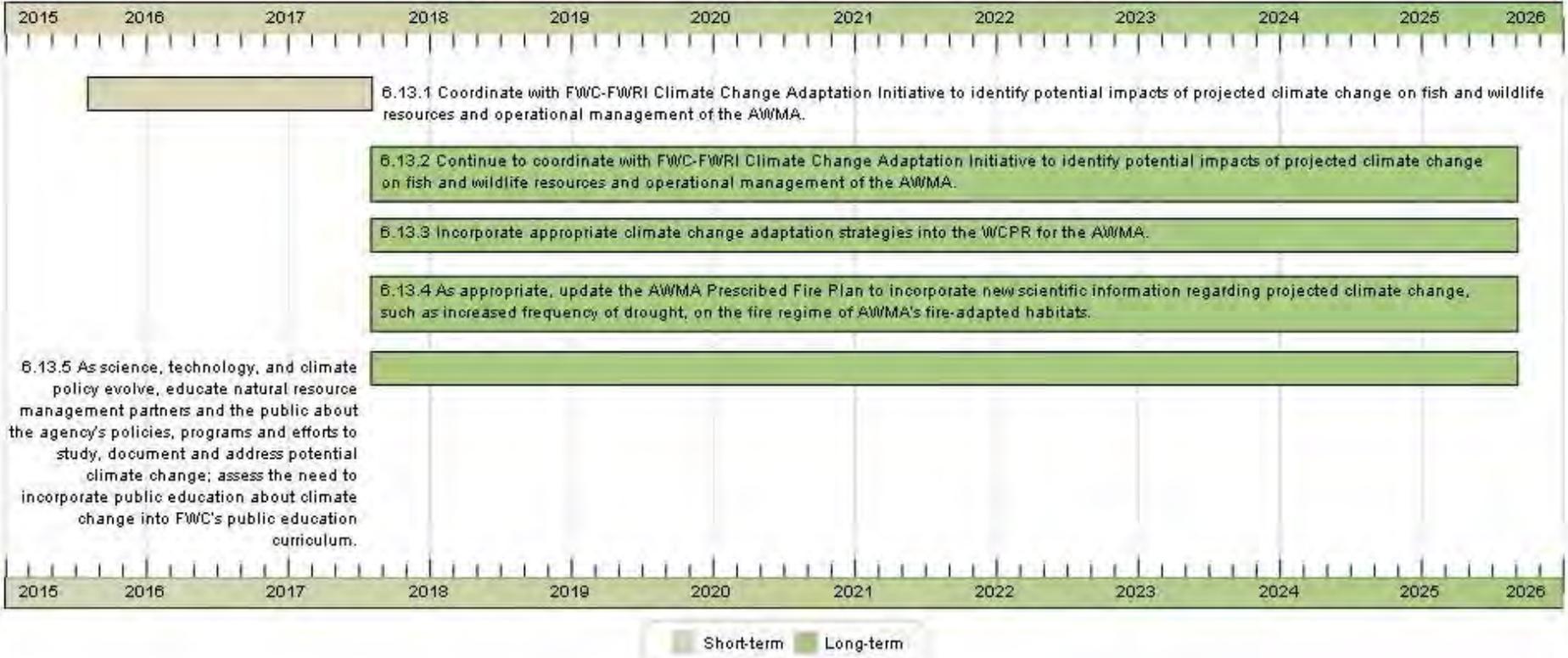


Apalachee Wildlife Management Area
 Management Plan - Goals and Objectives - Timelines for Completion



Climate Change

Goal: Develop appropriate adaptation strategies in response to projected climate change effects and their potential impacts on natural resources, including fish and wildlife, and the operational management of the AWMA.



Apalachee Wildlife Management Area
Management Plan - Goals and Objectives - Timelines for Completion

8 Resource Management Challenges and Strategies

The following section identifies and describes further management needs and challenges associated with 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.

8.1 Challenge: Prohibited use of off-road ATVs negatively impact sandhill natural community ground cover and diminish the overall aesthetics of the area. Unauthorized access borders county roads.

- 8.1.1 Strategy: Continue to post signs prohibiting ATV use along county road access.
- 8.1.2 Strategy: Install additional gates and fences along the most frequented illegally access sections.
- 8.1.3 Strategy: Inform FWC law enforcement of activities when in progress so offending persons may be confronted.

8.2 Challenge: Dumping/littering that has negative impacts on natural communities and degrades the aesthetic qualities of the area.

- 8.2.1 Strategy: Through news media outlets, postings at entrance kiosks, and signage, inform public about these activities and their detrimental effects on the area.
- 8.2.2 Strategy: Use on-hand resources to clean up the area in a timely manner as not to encourage further dumping/litter. Use local volunteers if available.
- 8.2.3 Strategy: Inform FWC law enforcement of dumping so that they can investigate.

9 Cost Estimates and Funding Sources

The following represents the actual and unmet budgetary needs for managing the lands and resources of AWMA. This cost estimate was developed using data developed by the FWC and other cooperating entities, and is based on actual costs for optimal land management activities, equipment purchase and maintenance, and for 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 mitigation, may be sought to supplement existing funding.

The cost estimate below, 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 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 AWMA Fiscal Year 2014-2015 Operational Plan showing detailed cost estimates by activity and categories of expenditures, may be found in Appendix 13.14.

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Apalachee WMA Management Plan Cost Estimate
Maximum expected one year expenditure

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>
Exotic Species Control	\$41,522	(1)
Prescribed Burning	\$27,392	(1)
Cultural Resource Management	\$1,152	(1)
Timber Management	\$1,152	(1)
Hydrological Management	\$2,044	(1)
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$111,508	(1)
Subtotal	\$184,770	
<u>Administration</u>		
General administration	\$6,613	(1)
<u>Support</u>		
Land Management Planning	\$12,522	(1)
Land Management Reviews	\$7,144	(3)
Training/Staff Development	\$4,957	(1)
Vehicle Purchase	\$57,133	(2)
Vehicle Operation and Maintenance	\$60,740	(1)
Other (Technical Reports, Data Management, etc.)	\$18,479	(1)
Subtotal	\$160,973	
<u>Capital Improvements</u>		
New Facility Construction	\$140,239	(2)
Facility Maintenance	\$35,244	(1)
Subtotal	\$175,483	
<u>Visitor Services/Recreation</u>		
Info./Education/Operations	\$35,711	(1)
<u>Law Enforcement</u>		
Resource protection	\$5,566	(1)
<u>Total</u>	\$569,117	*

Priority schedule:

- (1) Immediate (annual)**
- (2) Intermediate (3-4 years)**
- (3) Other (5+ years)**

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

Apalachee WMA Management Plan Cost Estimate
Ten-year projection

<u>Resource Management</u>	<u>Expenditure</u>	<u>Priority</u>
Exotic Species Control	\$476,003	(1)
Prescribed Burning	\$314,016	(1)
Cultural Resource Management	\$13,209	(1)
Timber Management	\$13,209	(1)
Hydrological Management	\$23,427	(1)
Other (Restoration, Enhancement, Surveys, Monitoring, etc.)	\$1,278,316	(1)
Subtotal	\$2,118,180	
<u>Administration</u>		
General administration	\$75,812	(1)
<u>Support</u>		
Land Management Planning	\$143,551	(1)
Land Management Reviews	\$15,425	(3)
Training/Staff Development	\$56,822	(1)
Vehicle Purchase	\$262,328	(2)
Vehicle Operation and Maintenance	\$696,311	(1)
Other (Technical Reports, Data Management, etc.)	\$211,836	(1)
Subtotal	\$1,386,273	
<u>Capital Improvements</u>		
New Facility Construction	\$298,080	(2)
Facility Maintenance	\$404,032	(1)
Subtotal	\$702,112	
<u>Visitor Services/Recreation</u>		
Info./Education/Operations	\$409,392	(1)
<u>Law Enforcement</u>		
Resource protection	\$63,813	(1)
<u>Total</u>	\$4,755,580	*

Priority schedule:

- (1) Immediate (annual)
- (2) Intermediate (3-4 years)
- (3) Other (5+ years)

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

10 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” below are those that 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 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 ✓
- Exotic species control ✓
- Mechanical vegetation treatment ✓
- Public contact and educational facilities development ✓
- Prescribed burning ✓
- Timber harvest activities ✓
- Vegetation inventories ✓

11 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 Americans with Disabilities 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 handicap access is structurally impractical or where providing such access would change the fundamental character of the facility being provided).

Uses planned for 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 as described in its Agency Strategic Plan (Appendix 13.8). 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 372, 253, 259, 327, 370, 403, 870, 375, 378, 379, 487, and 597 Fla. Stat.

The FWC has developed and utilizes an Arthropod Management Plan for AWMA in compliance with Chapter 388.4111 Fla. Stat. (Appendix 13.15). This plan was developed in cooperation with the local Jackson County arthropod control agency. This plan is also in conformance with the Local Government Comprehensive Plan as approved and adopted for Jackson County, Florida, (Appendix 13.16).

12 Endnotes

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- ¹⁶ Parmesan, C. 2006. Ecological and evolutionary responses to recent climate change. *Annual Review of Ecology, Evolution, and Systematics* 37:637-669.
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- ¹⁸ Stevenson, J. C., M. S. Kearney, and E. W. Koch. 2002. Impacts of sea level rise on tidal wetlands and shallow water habitats: A case study from Chesapeake Bay. *American Fisheries Society Symposium* 32:23-36.
- ¹⁹ IPCC. 2007b. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK.