A Conceptual Management Plan

for

HALF MOON WILDLIFE MANAGEMENT AREA

2001 - 2006

Sumter County, Florida

Florida Fish and Wildlife Conservation Commission
Division of Wildlife
Bureau of Wildlife Management
620 South Meridian Street
Tallahassee, Florida
32399-1600

Department of
Environmental Protection

Jeb Bush
Governor

David B. Struhs
Secretary

January 25, 2001

Mr. Scott Sanders
Florida Fish and Wildlife Conservation Commission
Farris Bryant Building, Room 235
620 S. Meridian Street
Tallahassee, Florida 32399-1600

Re: Half Moon Wildlife Management Area
Three Lakes Wildlife Management Area

Dear Mr. Sanders:

On January 25, 2001, the Acquisition and Restoration Council recommended approval of the management plans for Half Moon and Three Lakes Wildlife Management Areas. These plans, are approved by the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund. Pursuant to Section 253.034 and 259.032, Florida Statutes, and Chapter 18-2, Florida Administrative Code, these plans' five-year updates will be due on **January 26, 2006**.

Approval of these plans 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 plan might require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities.

Sincerely,

Delmas T. Barber

Delmas T. Barber
Office of Environmental Services
Division of State Lands

DTB/

RECEIVE
JAN 29 2001
BUREAU OF
WILDLIFE MANAGEMI

A CONCEPTUAL MANAGEMENT PLAN FOR THE

HALF MOON WILDLIFE MANAGEMENT AREA

SUMTER COUNTY, FLORIDA

2001-2006

Owned by the Board of Trustees, State of Florida

Managed by the Florida Fish and Wildlife Conservation Commission

Prepared by:

Florida Fish and Wildlife Conservation Commission
Division of Wildlife
Bureau of Wildlife Management

January, 2001

Approved: _____

Frank Montalbano III, Director
Division of Wildlife

LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

Land Agency: Fish and Wildlife Conservation Commission (FWC)
Common Name of Property: Half Moon Wildlife Management Area
Location: Sumter County
Acreage: Total: 9,480

Acreage Breakdown:

Land Cover Classification	**Acreage**
Pinelands	1,400
Sandhill	150
Xeric Hardwood Hammock	1,300
Freshwater Marsh / Wet Prairie	800
Mesic Hardwood Forest	930
Hardwood /Floodplain/Shrub Swamp	3,500
Ruderal	1,400

Lease/Management Agreement No.: 3789
Use: Single _____
Multiple X

Management Responsibilities

Agency	Responsibilities
FWC	LEAD (Wildlife management, resource protection, law enforcement)
SWFWMD	COOPERATOR / LESSOR (Water resources)

Designated Land Use: Wildlife Management Area
Contract(s): Cattle grazing contract
Encumbrances: Easements (3); oil, gas & mineral rights (1); subsurface rights (1)
Type Acquisition: CARL / SOR
Unique Features: Natural: Mill Creek (Spring run stream); Withlacoochee River
Archaeological/Historical 5 Historic sites
Management Needs: Bahiagrass pasture restoration
Acquisition Needs/Acreage: Stephens (920 acres); parcels along Withlacoochee River (various)
Surplus Lands/Acreage: None
Public Involvement: Management Advisory Group consensus building meeting, and Public Hearing (Appendix X)

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

ARC Approval Date _____ BTIITF Approval Date: _____

Comments: _____

MANAGEMENT PLAN COMPLIANCE CHECKLIST

REQUIREMENTS	PAGE NUMBERS
18-2.021 Land Management Advisory Council.	
(4) Management Plans. Plans submitted to the division for council review under the requirements of Section 253.034 F.S. should contain where applicable to the management of resources the following:	
1. The common name of the property.	1
2. A map showing the location and boundaries of the property plus any structures or improvements to the property.	3
3 The legal description and acreage of the property.	76
4 The degree of title interest held by the Board, including reservations and encumbrances such as leases.	4
5. The land acquisition program (e.g., C. A. R. L., E. E. L., Save Our Coast), if any, under which the property was acquired.	1
6. The designated single use or multiple use management for the property, including other managing agencies.	43
7. Proximity of property to other significant State, local, or federal land or water resources.	5-6
8. A statement as to whether the property is within an aquatic preserve or a designated area of critical State concern or an area under study for such designation.	2, 36
9 The location and description of known and reasonably identifiable renewable and non-renewable resources of the property including, but not limited to, the following:	---
A. Brief description of soil types, using U. S. D. A. maps when available;	10-11
B. Archaeological and historical resources;	36-38
C. Water resources including the water quality classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Waters;	23, 35
D. Fish and wildlife and their habitat;	13, 25-33
E. State and federally listed endangered or threatened species and their habitat;	34
F. Beaches and dunes;	N/A
G. Swamps, marshes and other wetlands;	3, 20
H. Mineral resources, such as oil, gas and phosphate;	35
I. Unique natural features, such as coral reefs, natural springs, caverns, large sinkholes, virgin timber stands, scenic vistas, and natural rivers and streams; and	23, 35

MANAGEMENT PLAN COMPLIANCE CHECKLIST

REQUIREMENTS	PAGE NUMBERS
J. Outstanding native landscapes containing relatively unaltered flora, fauna, and geological conditions.	35
10. A description of actions the agency plans, to locate and identify unknown resources such as surveys of unknown archaeological and historical resources.	37, 49-56
·**11.** The identification of resources on the property that are listed in the Natural Area Inventory.	13, 106
·**12.** A description of past uses, including any unauthorized uses of the property.	39
·**13.** A detailed description of existing and planned use(s) of the property.	41-42, 44, 49-46
·**14.** A description of alternative or multiple uses of the property considered by the managing agency and an explanation of why such uses were not adopted.	43-44
·**15.** A detailed assessment of the impact of planned uses on the renewable and non-renewable resources of the property and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to mitigate damage caused by such uses.	42
·**16.** A description of management needs and problems for the property.	49-53
·**17.** Identification of adjacent land uses that conflict with the planned use of the property, if any.	N/A
·**18.** A description of legislative or executive directives that constrain the use of such property.	2
·**19.** A finding regarding whether each planned use complies with the State Lands Management Plan adopted by the Trustees on March 17, 1981, and incorporated herein by reference, particularly whether such uses represent "balanced public utilization", specific agency statutory authority, and other legislative or executive constraints. A copy of the plan may be obtained by writing to the Department of Environmental Protection, Division of State Lands, Bureau of Land Management Services, 3900 Commonwealth Boulevard, Mail Station 130, Tallahassee, Florida 32399-3000.	42, 43
·**20.** An assessment as to whether the property, or any portion, should be declared surplus.	43
·**21.** 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.	6-8

MANAGEMENT PLAN COMPLIANCE CHECKLIST

REQUIREMENTS	PAGE NUMBERS
·**22.** A description of the management responsibilities of each agency and how such responsibilities will be coordinated, including a provision that requires that the managing agency consult with the Division of Archives, History and Records Management before taking actions that may adversely affect archaeological or historic resources.	42
·**23.** A statement concerning the extent of public involvement and local government participation in the development of the plan, if any, including a summary of comments and concerns expressed.	9, 198
Additional Requirements—Per Trustees	
·**24.** Letter of Compliance of the management plan with the Local Government Comprehensive Plan.	60, 216
253.034 State-Owned Lands; Uses. —	
(5) Each entity managing conservation lands shall submit to the Division of State Lands a land management plan at least every 5 years in a form and manner prescribed by rule by the board.	
·**25.** All management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing entity plans to identify, locate, protect and preserve, or otherwise use fragile nonrenewable resources, such as archaeological and historic sites, as well as other fragile resources, including endangered plant and animal species.	49-56
·**26.** Provide for the conservation of soil and water resources and for the control and prevention of soil erosion.	61
·**27.** Land management plans submitted by an entity shall include reference to appropriate statutory authority for such use or uses and shall conform to the appropriate policies and guidelines of the state land management plan.	60
·**28.** All land management plans for parcels larger than 1,000 acres shall contain an analysis of the multiple-use potential of the parcel, which analysis shall include the potential of the parcel to generate revenues to enhance the management of the parcel.	43-44
·**29.** Additionally, the land management plan shall contain an analysis of the potential use of private land managers to facilitate the restoration or management of these lands.	60

MANAGEMENT PLAN COMPLIANCE CHECKLIST

REQUIREMENTS	PAGE NUMBERS
253.036 Forest Management. —	
·**30.** For parcels larger than 1,000 acres the lead agency shall prepare the analysis, which shall contain a component or section prepared by a qualified professional forester which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management objectives of the parcel.	34-35, 230
259.032 Conservation And Recreation Lands Trust Fund; Purpose. —	
(10)(a) State, regional, or local governmental agencies or private entities designated to manage lands under this section shall develop and adopt, with the approval of the board of trustees, an individual management plan for each project designed to conserve and protect such lands and their associated natural resources. Private sector involvement in management plan development may be used to expedite the planning process. Individual management plans shall conform to the appropriate policies and guidelines of the state land management plan and shall include, but not be limited to:	
·**31.** Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group.	9, 198
·**32.** The advisory group shall conduct at least one public hearing within the county in which the parcel or project is located.	9, 198
·**33.** 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.	208-211
·**34.** 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.	246
·**35.** Individual management plans shall conform to the appropriate policies and guidelines of the state land management plan and shall include, but not be limited to:	---
A. A statement of the purpose for which the lands were acquired, the projected use or uses as defined in s. 253.034, and the statutory authority for such use or uses.	43-44, 60
B. Key management activities necessary to preserve and protect natural resources and restore habitat, and for controlling the spread of nonnative plants and animals, and for prescribed fire and other appropriate resource management activities.	49-56

MANAGEMENT PLAN COMPLIANCE CHECKLIST

REQUIREMENTS	PAGE NUMBERS
C. A specific description of how the managing agency plans to identify, locate, protect, and preserve, or otherwise use fragile, nonrenewable natural and cultural resources.	49-56
D. A priority schedule for conducting management activities, based on the purposes for which the lands were acquired.	49-56
E. A cost estimate for conducting priority management activities, to include recommendations for cost-effective methods of accomplishing those activities.	57-59
F. A cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired. The cost estimate shall include recommendations for cost-effective methods of accomplishing those activities.	57-59
·**36.** A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	43, 44, 248
259.036 Management Review Teams.—	
·**37.** The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required 5-year update of its management plan.	61

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A CONCEPTUAL MANAGEMENT PLAN
FOR THE
HALF MOON WILDLIFE MANAGEMENT AREA

I. GENERAL INFORMATION

The following management plan is submitted for review to the Board of Trustees of the Internal Improvement Trust Fund (Trustees) of the State of Florida, through the Department of Environmental Protection, Division of State Lands, in compliance with paragraph 7 of Lease No. 3789 (Appendix I) and pursuant to Chapters 253 and 259, Florida Statutes (F.S.), and Chapters 18-2 and 18-4, Florida Administrative Code (F.A.C.). Format and content were drafted in accordance with Acquisition and Restoration Council requirements for management plans.

A. Land Acquisition

1. Purchase: The Carlton Half Moon Ranch project qualified for purchase by the State under "other lands" criteria of the Conservation and Recreation Lands (CARL) program. On August 15, 1989, W. Albert and Barbara C. Carlton conveyed title to Carlton Half Moon Ranch to the Trustees for the sum of $5.04 million (Appendix I -Warranty Deed and Legal Description). Fair market value was estimated at $1,200 per acre. Negotiated contract price was $1,119.25 per acre. The purchase total included survey expenses and nominal other costs, but was discounted approximately $7,400 in compensation for boundary fence encroachments that encompassed 6.6 acres.

The original 4,458 acre tract, now commonly referred to as Half Moon Wildlife Management Area (HMWMA), was the largest single acquisition of the 11,500-acre CARL project (as yet incomplete). The primary objectives of the purchase were to preserve the water quality of the Withlacoochee River, Gum Slough, and their proximal tributaries; and collaterally to establish a wildlife management area. An additional 878 acres (Seven Springs / Smith Tract) were purchased in 1992. The Potter property (122 acres) was subsequently added in 1996. The current acreage is 9,480, which includes 4,021 acres leased from the Southwest Florida Water Management District (SWFWMD), and purchased under the Save Our Rivers (SOR) Program. Figure 1 indicates the existing boundary of HMWMA, roads, trails, infrastructure, hydrological systems, and wetlands existing on and around HMWMA.

2. Location: HMWMA lies near Rutland in northwestern Sumter County, (Figures 1 and 2). approximately 25 miles south-southwest of Ocala. Public access is available from County Road 247, off State Road 44, about 7 miles west of Interstate 75 and the Florida Turnpike. Metropolitan areas within 70 miles include Orlando, Tampa, and Gainesville. HMWMA is not within an area of critical state concern or presently under study for such designation.

3. Management Authority: By lease agreement (Lease No. 3789, Appendix I), the Game and Fresh Water Fish Commission (GFC, now the Florida Fish and Wildlife Conservation Commission (FWC)) was designated the sole management agency for HMWMA. Commission Establishment Order No.: WMA I-89-14 established HMWMA as a Type I Wildlife Management Area on December 18, 1989. The legal description of the property is found within the lease agreement (Appendix I).

In May 1992, the FWC and the SWFWMD entered into agreement wherein 4,021 acres were added to HMWMA (Appendix II). This acreage borders the original tract on the west. The one year agreement is automatically renewed each year until cancelled by one of the parties. Under this agreement, the FWC's duties include public hunt administration and law enforcement. The FWC may also initiate wildlife habitat improvement and biological surveys on the tract, subject to SWFWMD approval.

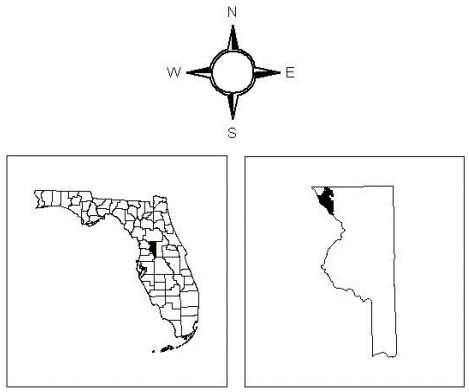
4. Executive/ Legislative/Management Directives: The 50-year Trustees lease agreement directed the FWC to "manage the leased premises only for the conservation and protection of natural and historical resources and resource-based, public outdoor recreation which is compatible with the conservation and protection of these public lands, as set forth in subsection 253.023(11), FS...". Further, to "implement applicable Best Management Practices for all activities under this lease in compliance with paragraph 18-2.004(1)(d), FAC, which have been selected, developed, or approved ... for the protection and enhancement of the leased premises."

To insure the greatest possible combination of public benefits, within purchase objectives and management directives, multiple use concepts guide management strategies on

Half Moon

Wildlife Management Area
(9,480 Acres)
Sumter County, Florida.

Figure 1: Basemap



Legend

- Boundary
- Check station
- Parking area
- Major road
- Road
- Trail
- Major water body
- Wetland

1 0 1 Miles

HMWMA. Presently the primary uses include wildlife habitat management, cattle grazing and natural resource-based recreation.

5. Title Interest and Encumbrances: The Board of Trustees holds the fee title interest to HMWMA, with the following title encumbrances:

a. Perpetual easement for ingress and egress to SWFWMD (Official Record Book 336, page 604, Public Records of Sumter County, Florida);

b. Easement reserved by Sumter Electrical Cooperative, Inc., in that Quit Claim Deed, dated August 14, 1989, from SECO to Albert and Barbara Carlton (Official Record Book 392, page 95, Public Records of Sumter County, Florida);

c. Easement agreement for ingress and egress to Drake Ranch (Official Record Book 389, page 134, Public Records of Sumter County, Florida);

d. Oil, gas, and minerals rights held by M.B. Rudman (Official Records Book 259, page 112, Public Records of Sumter County, Florida); and

e. Subsurface interests held by James G. Allison (Deed Book 121, page 328A, Public Records of Sumter County, Florida).

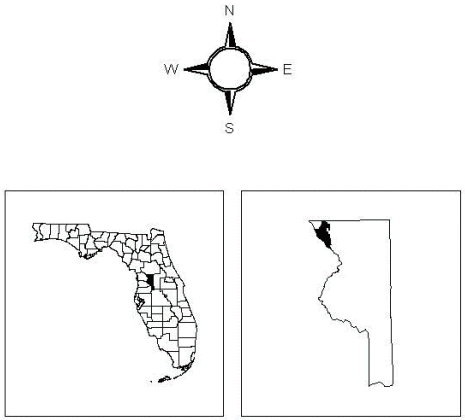
Additionally, periodic access permits are granted by FWC, to owners of inholdings and adjacent properties, as well as to the cattle grazing contractor.

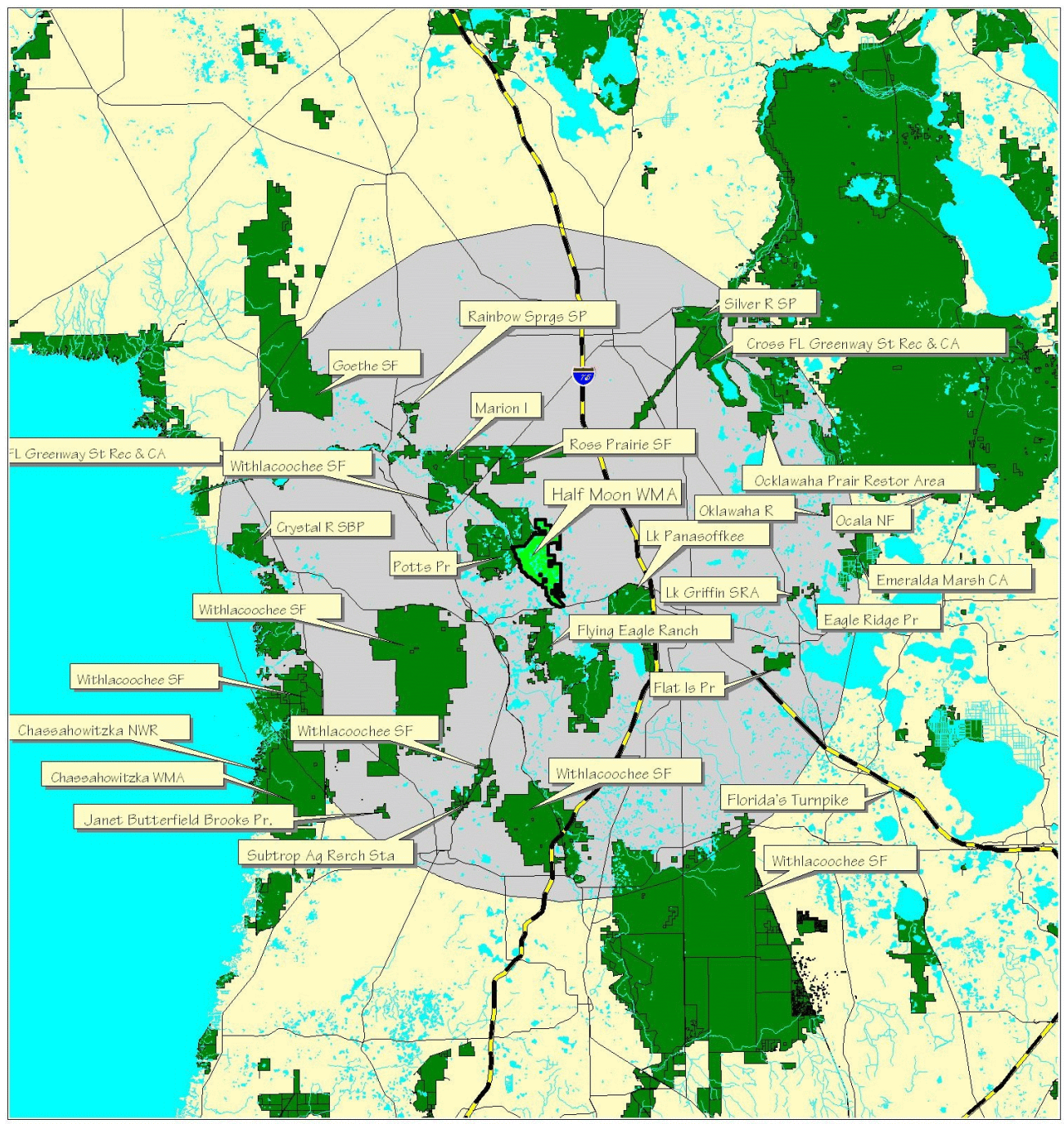
B. Proximity to Other Public Properties: Numerous properties within the public domain lie within Sumter County or proximate portions of adjacent counties (Figure 2). Primary managing agencies for nearby public lands, and acreage estimates, are as follows:

Half Moon

Wildlife Management Area
(9,480 Acres)
Sumter County, Florida.

Figure 2: Vicinity map





Federal	**Managing Agency**	**Acreage**
Chassahowitzka NWR	USDI-FWS	23,700[1]
Crystal River NWR	USDI-FWS	33
State		
Berry Tract	SWFWMD	952
Carlton Tract[2]	SWFWMD	4,021
Crystal River State Reserve	DEP	1,765
Dade Battlefield State Historic Site	DEP	80
Flying Eagle Wildlife Management Area	SWFWMD	10,247
Fort Cooper State Park	DEP	704
Lake Panasoffkee Wildlife Management Area	SWFWMD	9,551
Lake Rousseau State Recreation Area	DEP	1,800
Panasoffkee Tract	SWFWMD	532
Potts Preserve and Wildlife Management Area	SWFWMD	8,500
Goethe State Forest and Wildlife Management Area	DOF	50,171
Ross Prairie State Forest and Wildlife Management Area	DOF	3,511
St. Martin's Aquatic Preserve	DEP	23,123
Withlacoochee State Forest	DOF	154,529
Homosassa Wildlife Management Area	DOF	5,676
Jumper Creek Wildlife Management Area	DOF	10,592
Citrus Wildlife Management Area	DOF	41,000
Croom Wildlife Management Area	DOF	20,555
Richloam Wildlife Management Area	DOF	55,920
Baird Unit Wildlife Management Area	DOF	11,567

[1] Includes only those portions of Chassahowitzka NWR complex lying within neighboring Citrus County.
[2] Tract added to the management area by lease agreement (Appendix II)

Acronymic key:

DOF - Division of Forestry

DEP - Department of Environmental Protection

FWS - Fish and Wildlife Service

NWR - National Wildlife Refuge

SWFWMD - Southwest Florida Water Management District

USDI - United States Department of Interior

C. Prospective Land Acquisitions: All acreage currently comprising HMWMA is essential for present management and will be increasingly needed to meet projected recreational

uses and management goals. None should be considered surplus. Future management will be increasingly constrained by changing land use patterns of surrounding lands. Eventual isolation from other undeveloped land will require more intensive management to accommodate burgeoning recreational demands and maintain viable wildlife populations, especially of those species having very specific habitat requirements and comparatively low mobility.

Efforts should be continued to identify and acquire tracts along the Withlacoochee River to provide a buffer from development, and a habitat corridor from Green Swamp, the river's source, to its terminus in the Gulf at Yankeetown. Additional consideration should be given to acquisition of proximate uplands and wetland systems that contain significant natural or historical resources or offer the prospect of successful restoration. Toward this end, three parcels were approved for CARL purchase during 1990. The 878 acre Seven Springs Tract was purchased in 1992. The Potter tracts (2 tracts, 122 acres) were purchased in 1995.

Currently only 920 acres of the original CARL project remain in private ownership. This unit, formerly referred to as the Winn-Dixie tract, and now known as the Stephen's tract (Figure 3), is part of a larger Ventura Ranch holding that totals approximately 25,000 acres. The parcel is dominated by scrubby flatwoods, interspersed with an array of freshwater wetland types. The tract includes the source of Mill Creek, a small spring (volume <5 cubic feet per second) deriving its flow from the Floridan Aquifer. Additionally, the tract's uplands provide habitat for what is probably the most dense population of scrub-jays in Sumter County.

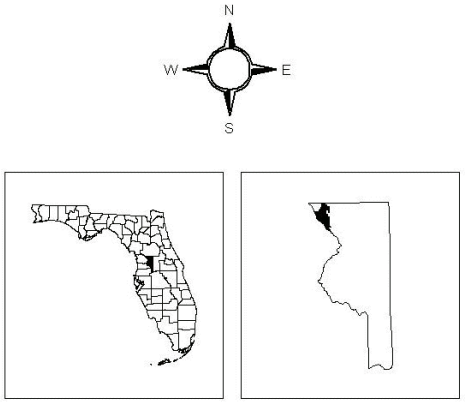
Fee simple acquisition of the entire Ventura Ranch merits consideration. The ranch includes all natural community types found on HMWMA, plus large stands of high quality sandhill and sand pine scrub community types. However, large expanses of these types have been converted and maintained as improved pasture. The possibility of obtaining a conservation easement on the Winn-Dixie tract should be explored if purchase is not possible.

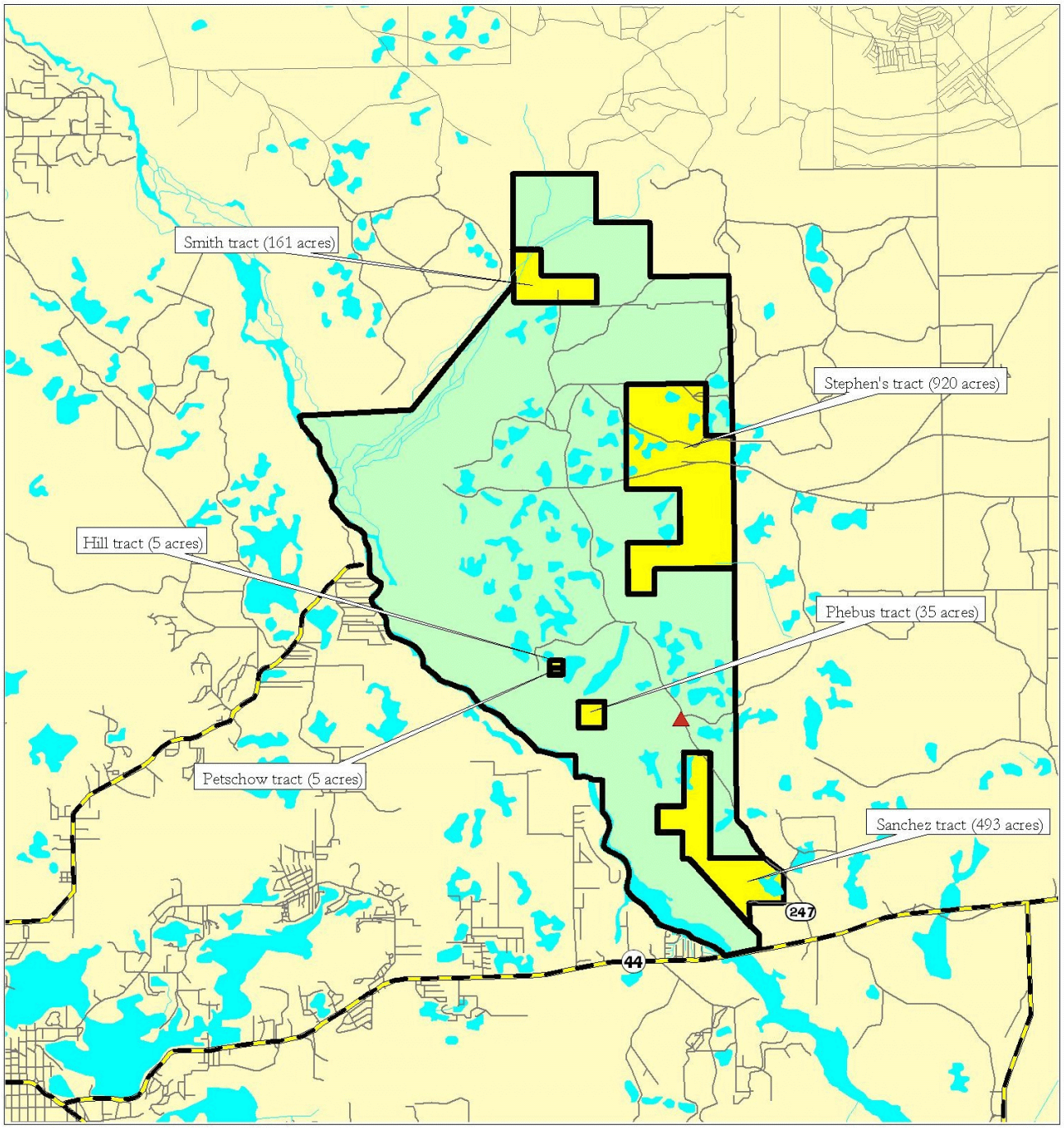
Other desirable prospective acquisitions adjacent to or contained within HMWMA include the Sanchez property (493 ac.), Seven Springs Ranch tract (approximately. 573 ac.), McGregor Smith Foundation tract (161 ac.), the Phebus tract (35 acres), Petschow and Hill tracts (5 acres each), the Drake Ranch (approx. 10,000 ac.), and Rocking-F Ranch (approx. 1,800 ac.). The properties currently being nominated within the FWC's Inholdings and Additions Program are indicated in Figure 3.

Half Moon

Wildlife Management Area
(9,480 Acres)
Sumter County, Florida.

Figure 3: Inholdings and additions map





Legend

- Check station
- Major road
- Road
- Major water body
- Inholdings and additions
- Half Moon WMA

1 0 1 Miles

Larger tracts should be considered for acquisition by the Forever Florida Program or the Save Our Rivers Program.

D. Public Involvement: On November 2, 1999, the FWC convened a Management Advisory Group consensus building meeting at the Sumterville Campus of the Lake Sumter Community College. The purpose of this meeting was to provide an opportunity for various stakeholders to provide input to the FWC at the beginning of the planning process. That input was used during the development of the conceptual management plan as one source of information for the development of goals, objectives and strategies for the HMWMA. This meeting brought together representatives of a number of organizations, representatives of local government and cooperating managers of the tract, and allowed these individuals an opportunity to identify the most important management needs and considerations for the plan update. The results of the meeting and the list of participants is found in Appendix X.

In addition, a public hearing which presented the results of the Management Advisory Group meeting, the draft goals, objectives, problems, strategies, and management intent for the HMWMA was presented to the general public on December 2, 1999, in Bushnell, Florida. A summary of this public hearing can also be found in Appendix X.

II. NATURAL AND CULTURAL RESOURCES

A. Physiography

1. Topography: Straddling the north-south Tsala Apopka Plain and Western Valley physiographic provinces, topography of HMWMA is comparatively flat. Conspicuous relief occurs only near margins of paludal depressions and crests of widely dispersed, relic dunes. Land surface altitudes range from 40 to 60 feet above mean sea level and increase generally from the Tsala Apopka Plain in the west to the Western Valley in the east.

2. Geology: Surface geology of HMWMA is characterized by a thick sequence of Cretaceous and Tertiary carbonate deposits discontinuously overlain by a thin, intermixed series

of Penholoway Terrace sediments; principally unconsolidated sand and clay, deposited during interglacial periods of Oligocene to Recent Epochs (Healy 1975). Surface features are dominated by the Ocala Group, a fine-grained, fossiliferous limestone deposited during the upper Eocene (White 1970). Three units in descending order, the Crystal River Formation, Williston Formation, and Inglis Formation, comprise the Ocala Group. All generally consist of foraminiferal limestone, but chert layers may occur throughout the Group. In addition, the Inglis Formation often contains dolomite. Avon Park Formation, a thick limestone and dolomite deposit of middle Eocene origin underlies the relatively shallow Ocala Limestone.

3. Soils: A variety of soils borne from either the Crystal River or Lower Ocala Group occur on HMWMA. All 7 soil orders recognized in Florida (Myers and Ewell eds. 1990) are represented on HMWMA, with 23 of the 68 total types found in the county being represented on the 4,458 acre tract. Soil types, divided by soil order, are listed in Appendix IV along with Natural Resource Conservation Service range site descriptions. Figure 4 is a map depicting the soil profile of HMWMA developed from SSURGO soil GIS data.

4. Climate: Climate is classified as humid and subtropical. The influences of the Caribbean Sea and the Gulf of Mexico prevent it from being arid or sub-humid. Variable and cyclic, the climate is affected by maritime influences and the North American land mass during the fall, winter, and early spring. This cycle features a dry cool season followed by a warm rainy season. During the dry season, damaging low temperatures can occur, and hurricanes and flooding occur during the wet season.

Sea breezes are important to local weather (Myers and Ewell eds. 1990). The long coastline assures some breeze throughout the year, but the effect is greatest during the summer. These breezes can produce rain both by convective action (thunderstorms) and by formation of front-like activity.

Half Moon

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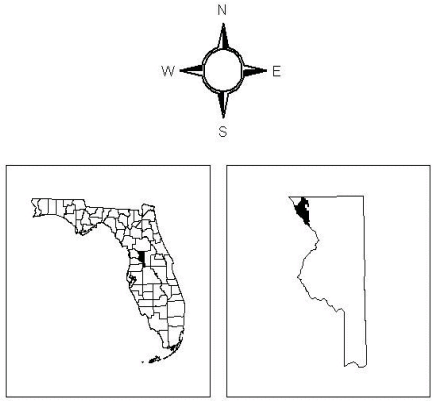
Figure 4: Soil profile



The climate of Sumter County is characterized by the same long, warm, and relatively humid summers, and dry, mild winters, as in the rest of the State. About 56% of the annual precipitation occurs from June through September in the form of intense late afternoon thunderstorms, that develop as a result of rising land air masses mixing with cool, encroaching sea breezes. Winter and spring precipitation typically results from less intense, longer-lasting continental weather developments.

Data collected at a weather station in Inverness, Florida, 9 miles west of HMWMA, shows an average annual rainfall of 53.1 inches over the last 20 years. Average monthly precipitation levels, over the last 20 years, have been highest in August (7.95 inches) and lowest in November (1.99 inches).

Summer daytime temperatures regularly reach or exceed 90 degrees Fahrenheit (F), especially during July and August, which are the two hottest months of the year. Winter daytime temperatures can vary widely but typically range from the high 50's F to the low 70's F during December, January and February. Nighttime sub-freezing temperatures, usually greater than 20 degrees F, can be expected once each winter.

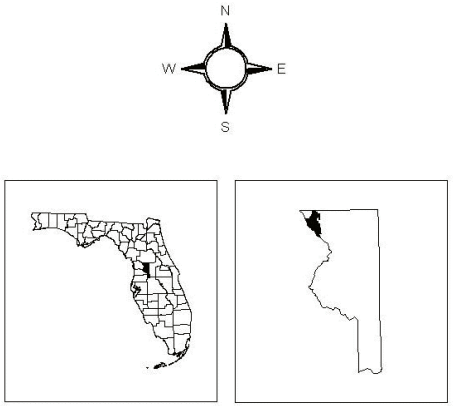
B. Vegetation

General vegetation patterns on HMWMA are characterized by a diverse mosaic of freshwater wetlands closely interspersed among flatwoods, hammocks, and ruderal sites, principally improved pastures. Uplands comprise approximately 55 percent of the total area.. From interpretation of 1972-73 aerial photographs, the Florida Natural Areas Inventory (FNAI) listed occurrences of floodplain swamp, floodplain forest, hydric hammock, prairie hammock, basin marsh, basin swamp, and mesic flatwoods within the project planning boundary (Appendix V). FNAI element occurrences (i.e., "single extant habitat which sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element") on or adjacent to the area are displayed in Figure 5. The complete records are listed in Appendix V, along with a letter of consent from FNAI allowing the FWC to access the GIS database. A LandSat map displaying vegetative classifications as interpreted from 1987 satellite imagery is found in Figure 6.

Half Moon

Wildlife Management Area
(9,480 Acres)
Sumter County, Florida.

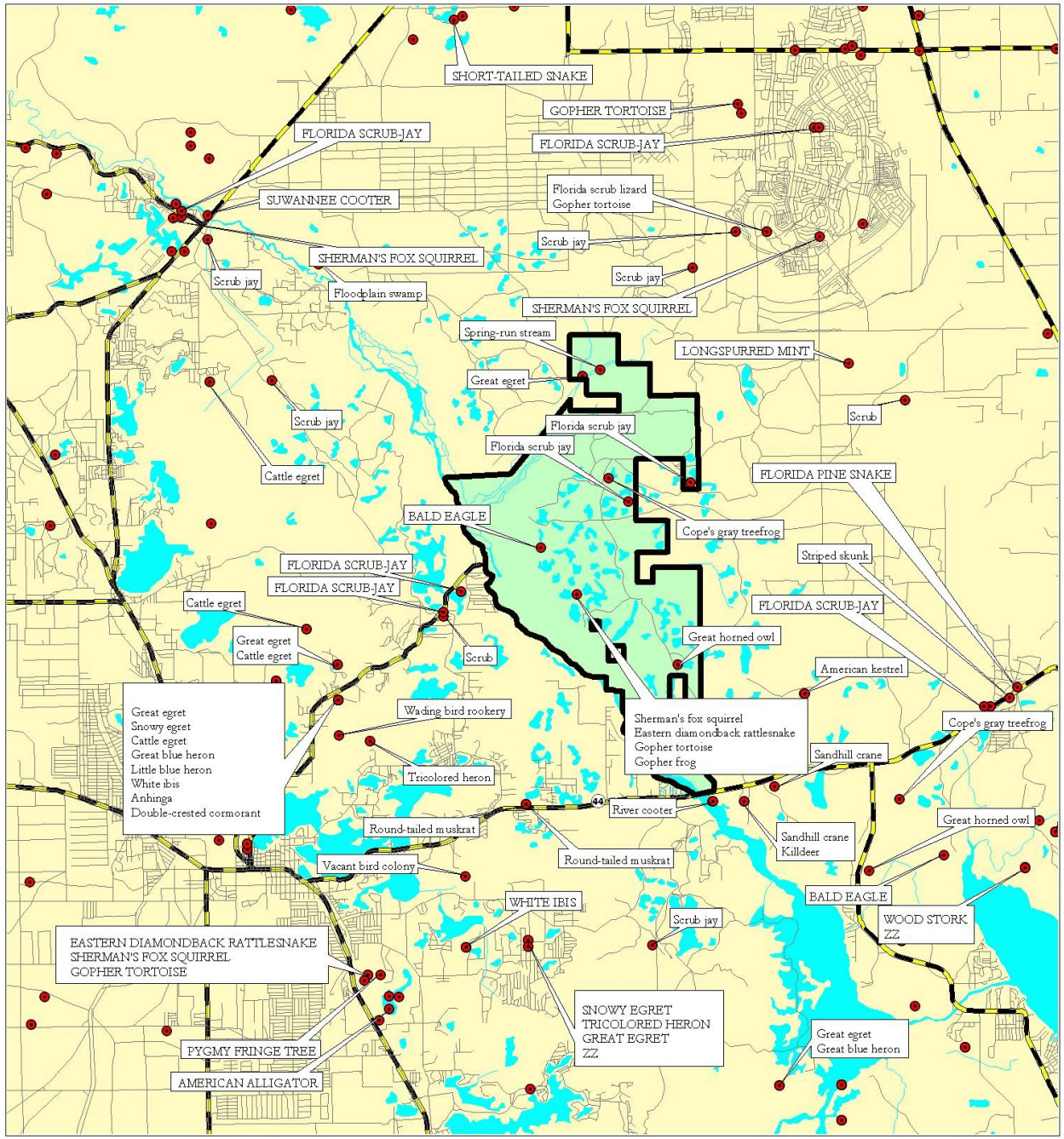
Figure 5: Wildlife element occurrences



Legend

- Wildlife element occurrence
- Major road
- Road
- Major water body
- Half Moon WMA

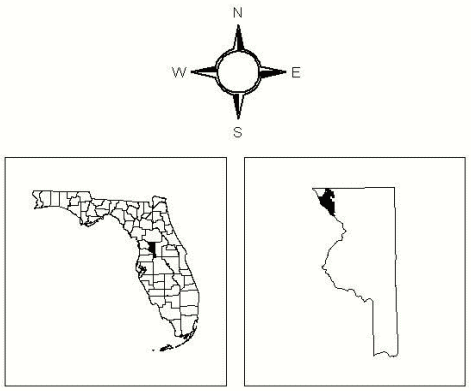
1 0 1 2 3 Miles

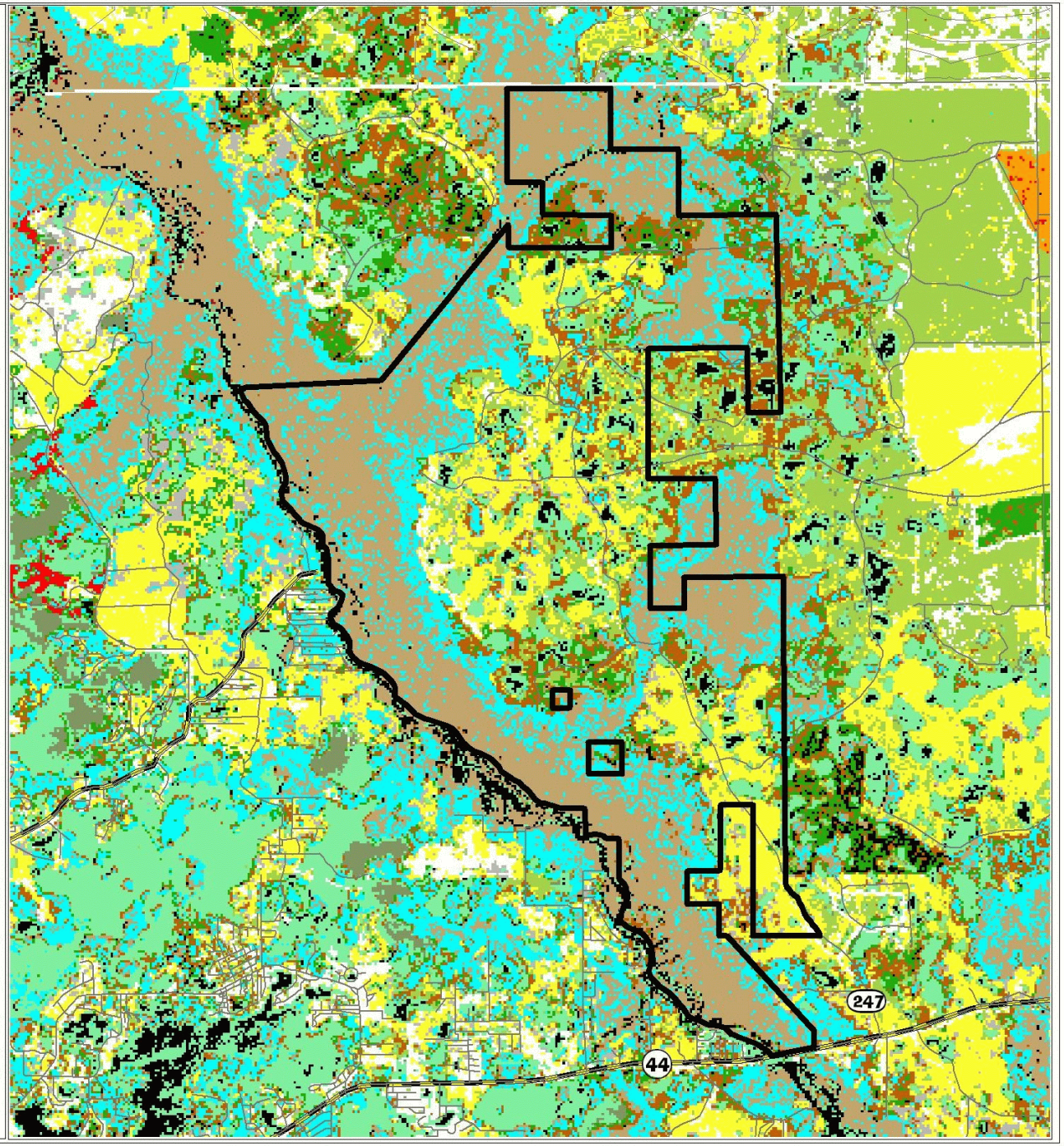


Half Moon

Wildlife Management Area
(9,480 Acres)
Sumter County, Florida.

Figure 6: LandSat imagery





Legend

- Boundary
- Road
- Major road

Legend

- Coastal strand
- Dry Prairie
- Pinelands
- Sandpine scrub
- Sandhill
- Oak scrub
- Mixed hardwood pine
- Hardwood hammock
- Tropical hammock
- Coastal saltmarsh
- Freshwater marsh
- Cypress swamp
- Hardwood swamp
- Bay swamp
- Shrub swamp
- Mangrove swamp
- Bottomland hardwood
- Grass and Ag. lands
- Shrub and brush
- Exotic plant communities
- Barren land
- Open water

1 0 1 Miles

Most natural communities on the area are dependent largely on periodic disturbances, primarily fire, for maintenance of biological diversity and relative stability. Important natural and altered communities are listed below. Taxonomic nomenclature follows Wunderlin (1982) and Godfrey (1988):

1. Scrubby Flatwoods: Lightly stocked, natural stands of longleaf pine (Pinus palustris), slash pine (Pinus elliottii), and loblolly pine (Pinus taeda), devoid of a well-developed midstory, dominate the physiognomy of non-ruderal, upland portions of HMWMA. Species composition and structure vary along subtle elevation, moisture, and edaphic gradients. Stratigraphy of the floristic community is characterized by a sparse, open-structured overstory of longleaf pine, subtended by a moderately dense understory of saw palmetto (Serenoa repens) and clumped patches of xerophytic oaks. Ground cover includes rhizomatous woody vegetation, forbs, and perennial grasses closely interspersed among small, widely scattered areas of bare sand.

Characteristic species commonly found in scubby flatwoods include:

a. Overstory
   - -- Longleaf pine (Pinus palustris)
   - -- Slash pine (Pinus elliottii)
   - -- Loblolly pine (Pinus taeda)

b. Understory
   - -- Saw palmetto (Serenoa repens)
   - -- Sand live oak (Quercus geminata)
   - -- Dwarf live oak (Quercus minima)
   - -- Running oak (Quercus pumila)
   - -- Myrtle oak (Quercus myrtifolia)
   - -- Laurel oak (Quercus laurifolia)
   - -- Gallberry (Ilex glabra)
   - -- Wax myrtle (Myrica cerifera)
   - -- Rusty lyonia (Lyonia ferruginea)
   - -- Gopher apple (Licania michauxii)
   - -- Tarflower (Befaria racemosa)

-- Shiny blueberry (Vaccinium myrsinites)

-- Chalky bluestem (Andropogon calliipes)

-- Threeawns (Aristida spp.)

-- Blazing star (Liatris spicata)

-- St. Andrew's Cross (Hypericum hypericoides)

-- Vanilla-plant (Carphephorus odoratissima)

2. Sandhill: Vestiges of sandhill vegetation occur sparingly over northwestern portions of HMWMA. Although most sites have been cleared for agriculture, the community probably occupied fewer than 150 acres before alteration by man.

Common floristic components of the community include:

a. Overstory

-- Longleaf pine (Pinus palustris)

b. Midstory

-- Bluejack oak (Quercus incana)

-- Turkey oak (Quercus laevis)

-- Sand post oak (Quercus margaretta)

c. Understory

-- Bracken fern (Pteridium aquilinum)

-- Threeawns (Aristida spp.)

-- Lopsided indiangrass (Sorghastrum secundum)

-- Winged sumac (Rhus copallina)

-- Sunflower (Helianthus angustifolius)

-- Prickly-pear cactus (Opuntia humifusa)

-- Gopher apple (Licania michauxii)

-- Persimmon (Diospyros virginiana)

-- Tread softly (Cnidoscolus stimulosus)

-- Queen's delight (Stillingia sylvatica)

-- Indigo (Indigofera caroliniana)

3. Ruderal: Ruderal sites occupy nearly 50 percent (approximately 1400 acres) of all uplands on HMWMA. Excepting early homesites, schools, cemeteries, and their immediate environs, most were cleared since 1940 and planted previously to row crops or exotic pasture grasses. Bahiagrass dominates most sites, however, pangola grass prevails on scattered excessively-drained sites. Other planted pasture grasses include alicia and hemarthia.

Edaphic features, topographic data, historical accounts, and observations of relict vegetation suggest most ruderal sites were occupied by scrubby flatwoods prior to clearing, cultivation, and maintenance of pastures. In the absence of the frequent maintenance practices (e.g., mowing, fertilization) of past landowners, these pastures, especially those planted to species other than bahiagrass, will revert to components of previous communities.

Pines and oaks are widely scattered throughout pastures. However, a well-defined upper stratum is absent. Flora are generally restricted to subordinate strata of forbs, grasses, and woody shrubs that demonstrate no pronounced affinity for any particular natural community. Common species of ruderal sites include the following:

-- Longleaf pine (Pinus palustris)
-- Slash pine (Pinus elliottii)
-- Cabbage palmetto (Sabal palmetto)
-- Saw palmetto (Serenoa repens)
-- Flat-sedge (Cyperus odoratus)
-- Blue-eyed grass (Sisyrinchium angustifolium)
-- Broomsedge (Andropogon virginicus)
-- Bahiagrass (Paspalum notatum)
-- Pawpaw (Asimina reticulata)
-- Hercules-club (Zanthoxylum clava-herculis)
-- Thistle (Cirsium horridulum)
-- Southern fleabane (Erigeron quercifolius)
-- Dog fennel (Eupatorium capillifolium)
-- Rabbit tobacco (Gnaphalium obtusifolium)
-- Dwarf dandelion (Krigia virginica)
-- Blackroot (Pterocaulon virgatum)

-- Poorman's pepper (Lepidium virginicum)
-- Frostweed (Helianthemum corymbosum)
-- Persimmon (Diospyros virginiana)
-- Crotalaria (Crotalaria sagittalis)
-- Bladderpod (Sesbania vesicaria)
-- Goat's rue (Tephrosia florida)
-- Live oak (Quercus virginiana)
-- Hypericum (Hypericum tetrapetalum)
-- Rustweed (Polypremum procumbens)
-- Pale meadow beauty (Rhexia mariana)
-- Wax myrtle (Myrica cerifera)
-- Primrose (Oenothera lacinata)
-- Yellow wood sorrel (Oxalis dillenii)
-- Maypop (Passiflora incarnata)
-- Sourgrass (Rumex hastatulus)
-- Agalinis (Agalinis purpurea)
-- Old-field toadflax (Linaria canadensis)
-- Carpetweed (Lippia nodiflora)
-- Sand blackberry (Rubus cuneifolius)

4. Xeric Hammock: Xeric hammocks are sparsely distributed; most prevalent at higher elevations (i.e., 55-60 feet above MSL) in northern sections of the area. Historically, these sites probably supported sandhill floral associates (e.g., longleaf pine/turkey oak), but apparently were attractive homestead sites, and have thus been altered by previous human habitation and livestock uses. In some stands, relict sandhill flora persist in the mid- and upper stories. However, most species have been replaced by xeric and mesic hardwoods.

Common vegetation of the xeric hammocks includes:

a. Overstory

-- Laurel oak (Quercus laurifolia)
-- Live oak (Quercus virginiana)

-- Longleaf pine (Pinus palustris)

-- Pignut hickory (Carya glabra)

b. Midstory

-- Cabbage palm (Sabal palmetto)

-- Laurel oak (Quercus laurifolia)

-- Summer grape (Vitis aestivalis)

c. Understory

-- Bear grass (Yucca filamentosa)

-- Broomsedge (Andropogon virginicus)

-- Yaupon (Ilex vomitoria)

-- Three-awns (Aristida spp.)

5. Mesic Hammock: Mesic hammocks occur widely over HMWMA, and are generally associated with paludal or stream margins and surficial deposits or outcroppings of limestone. Portions of some stands may flood briefly, or their substrates may remain saturated for extended periods during the growing season.

Area coverage, juxtaposition with other communities, stand stratification, and floral composition have resulted in partitioning of faunal niches, supporting high species richness. Characteristic vegetation of these hammocks includes:

a. Overstory

-- Live oak (Quercus virginiana)

-- Water oak (Quercus nigra)

-- Southern magnolia (Magnolia grandiflora)

b. Midstory

-- Southern red cedar (Juniperus silicicola)

-- Cabbage palm (Sabal palmetto)

-- Ironwood (Carpinus caroliniana)

-- Sweetgum (Liquidambar styraciflua)

-- American elm (Ulmus americana)

-- Red mulberry (Morus rubra)

c. Understory

-- Dwarf palmetto (Sabal minor)
-- Saw palmetto (Serenoa repens)
-- American holly (Ilex opaca)
-- Coralbean (Erythrina herbacea)
-- Partridge berry (Mitchella repens)
-- Wood sage (Teucrium canadense)
-- American beautyberry (Callicarpa americana)
-- Wild petunia (Ruellia caroliniensis)
-- Florida elephant's foot (Elephantopus elatus)

d. Epiphytes

-- Resurrection fern (Polypodium polypodiodes)
-- Spanish moss (Tillandsia usneoides)

6. Wetlands: Wetlands, defined by Cowardin et al. (1979) as "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered with shallow water," dominate the physiognomy of HMWMA. A diverse mosaic of riverine, palustrine, and lacustrine systems, including forested, emergent, aquatic bed, shrub, and unconsolidated bottom classes, with widely varying hydroperiods, occurs throughout the area, covering approximately 1,870 acres (United States Department of Interior, 1988).

This areal assemblage of aquatic systems contributes significantly to overall floral diversity, heterogeneity of habitat types, and associated fauna. In addition, area wetlands provide flood control, facilitate groundwater discharge, and generally improve and protect the quality of ground and nearby surface waters. These areas are also important nurseries for riverine fish species.

Generally, wetlands on the area are products of upwellings of ground water resulting from seepage from the water-table aquifer into depressions. However, Mill Creek, a riverine wetland system, arises from a spring of the Floridan aquifer.

Wetland types on HMWMA and their acreage, as measured from National Wetlands Inventory quadrangles (Lake Panasoffkee NW, Stokes Ferry, and Rutland, 1988), based on stereoscopic analyses of high altitude aerial photographs (Jan., 1984), are as follows (classification follows Cowardin et. al., 1979):

System: Lacustrine . . . . . 109 ac.
Subsystem: Littoral
Class: Aquatic bed
Subclass: Rooted vascular
Water Regime: Permanently flooded

System: Palustrine . . . . . 1,761 ac.
Subsystem: Not applicable

Class: Forested	855
Subclass: Broad-leaved deciduous (BLD) . . .	378
Water Regime: Seasonally flooded . . .	289
Water Regime: Temporarily flooded . . .	88
Subclass: Needle-leaved deciduous (NLD). . .	351
Water Regime: Semipermanently flooded	
Subclass: NLD/Broad-leaved evergreen (BLE) . .	2
Water Regime: Semipermanently flooded	
Subclass: BLE/BLD	3
Water Regime: Seasonally flooded	
Subclass: Deciduous	122
Water Regime: Semipermanently flooded . .	25
Water Regime: Seasonally flooded	97

Class: Scrub-Shrub	61
Subclass: Deciduous	7
Water Regime: Semipermanently flooded	
Subclass: BLD	53
Water Regime: Semipermanently flooded . .	51
Water Regime: Intermittently exposed . .	2
Class: Aquatic Bed	570
Subclass: Floating vascular	2
Water Regime: Permanently flooded	
Subclass: Rooted vascular	568
Water Regime: Permanently flooded	
Class: Emergent	330
Subclass: Persistent	
Water Regime: Temporarily flooded	9
Water Regime: Intermittently exposed . .	199
Water Regime: Seasonally flooded	6
Water Regime: Semipermanently flooded . .	111
Water Regime: Semipermanently flooded . .	5
Special Modifier: Partially drained/ditched	
Class: Unconsolidated Bottom	54
Subclass: Not available	
Water Regime: Permanently flooded	52
Water Regime: Permanently flooded	2
Special Modifier: Excavated	

Considerable impact or alteration of natural wetlands to accommodate area uses by previous landowners is apparent throughout HMWMA. Over 2 miles of ditches have been excavated to facilitate drainage of lacustrine and larger palustrine wetlands. Portions of at least 15 ponds were excavated to provide permanent sources of surface water for cattle and, perhaps, for management of game fishes. Forested wetlands exhibit evidence of logging (e.g., stumps, culled logs, logging trams), especially of bald cypress (Taxodium distichum). Until February, 1990, essentially all

wetlands were continuously grazed; limited only by the periodicity of high water, and relative abundance of ectoparasitic arthropods.

The Withlacoochee River, forming the western boundary of the area, along with Gum Slough and Gum Springs Run have been designated Outstanding Florida Waters by the Florida Legislature in 1989.

Vegetative composition and structure of area wetlands are affected by a host of factors including hydroperiods, edaphic characteristics, water chemistry, topography, fire, and artificial modifications by man. Individual wetlands, especially lacustrine and larger palustrine systems, contain several distinct wetland classes, and subclasses, each with characteristic flora.

Common hydrophytes and mesophytes on HMWMA includes the following:

a. Emergent

-- Maidencane (Panicum hemitomon)
-- Saw grass (Cladium jamaicense)
-- Bulrushes (Scirpus spp.)
-- Common arrowhead (Sagittaria latifolia)
-- White-top sedge (Dichromena colorata)
-- Pipewort (Eriocaulon decangulare)
-- Bloodroot (Lachnantes caroliniana)
-- Beak rush (Rhynchospora inundata)
-- Sand cordgrass (Spartina bakeri)
-- Pickerelweed (Pontederia cordata)
-- Yellow-eyed grass (Xyris elliottii)
-- Pond milkweed (Asclepias lanceolata)
-- St. Andrew's Cross (Hypericum hypericoides)
-- Pale meadow beauty (Rhexia mariana)
-- Smartweed (Polygonum hydropiperoides)
-- Prairie iris (Iris hexagona)
-- Marsh fleabane (Pluchea rosea)
-- Pink sundew (Drosera capillaris)
-- Yellow butterwort (Pinguicula lutea)

b. Aquatic Bed

-- Floating Bladderwort (Utricularia inflata)

-- White waterlilly (Nymphaea odorata)

-- Marsh pennywort (Hydrocotyle umbellata)

-- Duckweed (Lemna spp.)

c. Scrub-Shrub

-- Red maple (Acer rubrum)

-- Sea myrtle (Baccharis halimifolia)

-- Fetterbush (Lyonia lucida)

-- Wax myrtle (Myrica cerifera)

-- Buttonbush (Cephalanthus occidentalis)

-- Carolina willow (Salix caroliniana)

d. Forested

-- Bald cypress (Taxodium distichum)

-- Dwarf palmetto (Sabal minor)

-- Red maple (Acer rubrum)

-- Ironwood (Carpinus caroliniana)

-- Fetterbush (Lyonia lucida)

-- Live oak (Quercus virginiana)

-- Black gum (Nyssa sylvatica)

-- Ash (Fraxinus sp.)

-- American elm (Ulmus americana)

-- Swamp violet (Viola esculenta)

-- Virginia chain fern (Woodwardia virginica)

7. Exotics

Human occupancy and use of the area have introduced or allowed encroachment by numerous exotic or naturalized floral species. Naturalized pasture grasses dominate ground cover on ruderal sites. Domesticated exotics, especially woody ornamentals, are particularly prevalent at abandoned homesites. Species found include:

-- Spanish dagger (Yucca aloifolia)
-- Guava (Psidium guajava)
-- Chinaberry (Melia azedarach)
-- Shrub-verbena (Lantana camara)
-- Bahiagrass (Paspalum notatum)
-- Pangolagrass (Digitaria decumbens)
-- Cogongrass (Imperata cyclindrica)
-- Hermarthia grass (Limpo sp.)
-- Creeping oxeye (Wedelia trilobata)
-- Wild radish (Raphanus raphanistrum)
-- Sweet-shrub (Calycanthus floridanus)
-- Sicklepod (Cassia obtusifolia)
-- Common lespedeza (Lespedeza striata)
-- White clover (Trifolium repens)
-- Crape-myrtle (Lagerstroemia indica)
-- Florida purslane (Richardia scabra)
-- Water hyacinth (Eichhornia crassipes)
-- Sour orange (Citrus aurantium)
– Chinese tallow tree (Sapium sebiferum)
– Camphor tree (Cinnamomum camphora)

Appendix VI provides a taxonomic listing of all vascular flora recorded on the area through February 1994.

C. Wildlife

1. Resident Fauna: A wide variety of terrestrial vertebrates can be found on HMWMA, perhaps due to both the diversity and interspersion of vegetation types. Plant diversity itself has been shown to positively influence the number of wildlife species, and it likely is the principal factor influencing wildlife diversity on HMWMA. Interspersion of vegetation types results in many ecotonal areas. These ecotonal areas attract many species as they provide easy

access to two or more vegetation types. These areas are also valuable to wildlife species whose habitat requirements are more specific or localized due to small home ranges.

The following wildlife species are known to exist on HMWMA, either seasonally or annually. Their occurrence has been documented by FWC personnel, either wildlife management or law enforcement, since the property was acquired. A systematic inventory of all taxa has not yet been completed. However, in 1998 a drift-fence survey was conducted in the six dominant native habitats on HMWMA. During the 120 sampling days, 126 traps were monitored, and 3,686 amphibians and reptiles of 54 species were caught. Also, efforts toward procuring baseline inventories of fish species were conducted during the spring and summer of 1991 in Crescent and McKinney ponds.

The following is a list of wildlife species known to occur on HMWMA:

a.. Mammals

-- Opossum (Didelphis virginiana)
-- Nine-banded armadillo (Dasypus novemcinctus)
-- Eastern cottontail (Sylvilagus floridanus)
-- Marsh rabbit (Sylvilagus palustris)
-- Gray squirrel (Sciurus carolinensis)
-- Fox squirrel (Sciurus niger)
-- Southeastern pocket gopher (Geomys pinetis)
-- Cotton mouse (Peromyscus gossypinus)
-- Hispid cotton rat (Sigmodon hispidus)
-- Coyote (Canis latrans)
-- Raccoon (Procyon lotor)
-- River otter (Lutra canadensis)
-- Eastern spotted skunk (Spilogale putorius)
-- Bobcat (Felis rufus)
-- Feral hog (Sus scrofa)
-- White-tailed deer (Odocoileus virginianus)

b. Birds

-- Pied-billed grebe (Podilymbus podiceps)

-- Double-crested comorant (Phalacrocorax auritus)

– Anhinga (Anhinga anhinga)

– Great blue heron (Ardea herodius)

-- Great egret (Casmerodius albus)

-- Snowy egret (Egretta thula)

-- Little blue heron (Egretta caerulea)

-- Cattle egret (Bubulcus ibis)

-- Green-backed heron (Bitterwoods striatus)

-- American bittern (Botaurus lentiginosus)

-- White ibis (Eudocimus albus)

-- Wood stork (Mycteria americana)

-- Wood duck (Aix sponsa)

-- Mottled duck (Anas fulvigula)

– Blue-winged teal (Anas discors)

-- Hooded merganser (Lophodytes cucullatus)

-- Turkey vulture (Cathartes aura)

-- Black vulture (Coragyps atratus)

-- Swallow-tailed kite (Elanoides forficatus)

-- Osprey (Pandion haliaetus)

-- Bald eagle (Haliaeetus leucocephalus)

-- Northern harrier (Circus cyaneus)

-- Sharp-shinned hawk (Accipiter striatus)

-- Red-shouldered hawk (Buteo lineatus)

-- Red-tailed hawk (Buteo jamaicensis)

-- American kestrel (Falco sparverius)

-- Wild turkey (Meleagris gallopavo)

-- Northern bobwhite quail (Colinus virginianus)

-- Common moorhen (Gallinula chloropus)

-- American coot (Fulica americana)

-- Limpkin (Aramus guarauna)

-- Sandhill crane (Grus canadensis)

-- Killdeer (Charadrius vociferus)

-- Common snipe (Gallinago gallinago)

– American woodcock (Scolopax minor)

-- Rock dove (Columba livia)

-- Mourning dove (Zenaida macroura)

-- Common ground dove (Columbina passerina)

-- Yellow-billed cuckoo (Coccyzus americanus)

-- Eastern screech owl (Otus asio)

-- Great horned owl (Bubo virginianus)

-- Barred owl (Strix varia)

-- Barn owl (Tyto alba)

-- Common nighthawk (Chordeiles minor)

-- Chuck-will's-widow (Caprimulgus carolinensis)

-- Whip-poor-will (Caprimulgus vociferus)

-- Chimney swift (Chaetura pelagica)

-- Ruby-throated hummingbird (Archilochus colubris)

-- Belted kingfisher (Ceryle alcyon)

-- Red-headed woodpecker (Melanerpes erythrocephalus)

-- Red-bellied woodpecker (Melanerpes carolinus)

-- Downy woodpecker (Picoides pubescens)

-- Hairy woodpecker (Picoides villosus)

– Yellow-bellied sapsucker (Sphyrapicus varius)

– Northern flicker (Colaptes auratus)

-- Pileated woodpecker (Dryocopus pileatus)

– Eastern phoebe (Sayornis phoebe)

-- Great-crested flycatcher (Myriarchus crinitus)

–Vermillion flycatcher (Pyrocephalus rubinus)

-- Eastern kingbird (Tyrannus tyrannus)

– Barn swallow (Hirundo rustica)

-- Blue jay (Cyanocitta cristata)

-- Florida scrub jay (Aphelocoma coerulescens)

– American crow (Corvus brachyrynchos)

– Fish crow (Corvus ossifragus)

– Tufted titmouse (Parus bicolor)

-- Carolina chickadee (Parus carolinensis)

-- House wren (Troglodytes aedon)

-- Carolina wren (Thryothorus ludovicianus)

-- Blue-gray gnatcatcher (Polioptila caerulea)

-- Ruby-crowned kinglet (Regulus calendula)

-- Eastern bluebird (Sialia sialis)

– American robin (Turdus migratorius)

– Hermit thrush (Catharus guttatus)

-- Northern mockingbird (Mimus polyglottus)

– Brown thrasher (Toxostoma rufum)

– Gray catbird (Dumetella carolinensis)

-- Cedar waxwing (Bombycilla cedrorum)

-- Loggerhead shrike (Lanius ludovicianus)

-- European starling (Sturnus vulgaris)

-- White-eyed vireo (Vireo griseus)

-- Yellow-throated vireo (Vireo flavifrons)

– Red-eyed vireo (Vireo olivaceus)

– Northern parula (Parula americana)

-- Yellow-rumped warbler (Dendroica coronata)

-- Yellow-throated warbler (Dendroica dominica)

– Palm warbler (Dendroica palmarum)

– Pine warbler (Dendroica pinus)

-- Black-and-white warbler (Mniotilta varia)

-- Common yellowthroat (Geothlypis trichas)

-- Summer tanager (Piranga rubra)

-- Northern cardinal (Cardinalis cardinalis)

– Blue grosbeak (Guiraca caerulea)

-- Indigo bunting (Passerina cyanea)

-- Rufous-sided towhee (Pipilo erythrophthalmus)

-- Bachman's sparrow (Aimophila aestivalis)

-- Red-winged blackbird (Agelatus phoeniceus)

-- Brown-headed cowbird (Molothrus ater)

– Common grackle (Quiscalus quiscula)

-- Boat-tailed grackle (Quiscalus major)

-- Eastern meadowlark (Sturnella magna)

c. Amphibians

-- Oak toad (Bufo quercicus)

– Southern toad (Bufo terrestris)

-- Southern cricket frog (Acris g. gryllus)

-- Cope's gray treefrog (Hyla chrysoscelis)

– Green treefrog (Hyla cinerea)

-- Pinewoods treefrog (Hyla. femoralis)

-- Spring peeper (Hyla crucifer)

-- Barking treefrog (Hyla gratiosa)

– Squirrel treefrog (Hyla squirella)

– Little grass frog (Pseudacris ocularis)

– Southern chorus frog (Pseudacris nigrita)

– Greenhouse frog (Eleutherodactylus planirostris)

– Eastern narrowmouth toad (Gastrophryne carolinensis)

-- Eastern spadefoot toad (Scaphiopus h. holbrookii)

– Gopher frog (Rana capito)

– Bullfrog (Rana catesbeiana)

-- Pigfrog (Rana grylio)

– Southern leopard frog (Rana sphenocephala)

– Two-toed amphiuma (Amphiuma means)

-- Slimy salamander (Plethodon grobmani)

-- Eastern newt (Notopthalmus viridescens)

-- Striped newt (Notopthalmus perstriatus)

– Dwarf siren (Pseudobranchus striatus)

-- Greater siren (Siren lacertina)

– Lesser siren (Siren intermedia)

d. Reptiles

-- American alligator (Alligator mississippiensis)

– Chicken turtle (Deirochelys reticularia)

– Peninsula cooter (Pseudemys floridana peninsularis)

– Florida redbelly turtle (Pseudemys nelsoni)

– Florida box turtle (Terrapene carolina bauri)

– Striped mud turtle (Kinosternon baurii)

– Eastern mud turtle (Kinosternon subrubrum)

– Gopher tortoise (Gopherus polyphemus)

-- Florida softshell (Apalone ferox)

-- Florida worm lizard (Rhineura floridana)

-- Eastern glass lizard (Ophisaurus ventralis)

– Eastern slender glass lizard (Ophisaurus attenuatus longicaudus)

– Green anole (Anole carolinensis)

-- Brown anole (Anole sagrei)

– Southern fence lizard (Sceloporus undulatus)

-- Southeastern five-lined skink (Eumeces inexpectatus)

– Broadhead skink (Eumeces laticeps)

– Ground skink (Scincella lateralis)

-- Six-lined racerunner (Cnemidophorous sexlineatus)

-- Florida scarlet snake (Cemophora coccinea)

-- Southern black racer (Coluber constrictor priapus)

– Southern ringneck snake (Diadophis punctatus)

-- Eastern indigo snake (Drymarchon corais couperi)

-- Corn snake (Elaphe guttata)

-- Yellow rat snake (Elaphe obsoleta quadrivittata)

– Eastern mud snake (Farancia a. abacura)

– Scarlet kingsnake (Lampropeltis triangulum elapsoides)

– Eastern coachwhip (Masticophis flagellum)

-- Banded water snake (Nerodia fasciata pictiventris)

– Florida green water snake (Nerodia floridana)

-- Rough green snake (Opheodrys aestivus)

-- Striped crayfish snake (Regina alleni)

-- North Florida swamp snake (Seminatrix pygea)

– Florida brown snake (Storeria dekayi victa)

– Florida redbelly snake (Storeria occipitomaculata)

– Florida crowned snake (Tantilla relicta)

– Peninsula ribbon snake (Thamnophis sauritus sackenii)

– Bluestripe garter snake (Thamnophis sirtalis similis)

– Eastern garter snake (Thamnophis sirtalis sirtalis)

– Eastern coral snake (Micrurus fulvius)

-- Florida cottonmouth (Agkistrodon piscivorus conanti)

– Eastern diamondback rattlesnake (Crotalus adamanteus)

-- Dusky pygmy rattlesnake (Sistrurus miliarius barbouri)

e. Fish

- Bluegill (Lepomis macrochirus)
- Warmouth (Lepomis gulosus)
- Redear sunfish (Lepomis microlophus)
- Dollar sunfish (Lepomis marginatus)
- Largemouth bass (Micropterus salmoides)
- Brown bullhead (Ictalurus nebulosus)

- Brook silverside (Labidesthes sicculus)
- Swamp darter (Etheostoma fusiforme)
- Inland silverside (Menidia beryllina)
- Bluefin killifish (Lucania goodei)
- Mosquitofish (Gambusia affinis)
- Golden shiner (Notemigonus crysoleucas)
- Bowfin (Amia calva)
- Lake chubsucker (Erimyzon sucetta)
- Florida gar (Lepisosteus platyrhincus)

2. Endangered and Potentially Endangered Fauna: Several wildlife species occurring on HMWMA are classified as protected due to low or potentially low population levels:

Species	**Status**	
	FWC	USFWS
Bald eagle (Haliaeetus leucocephalus)	T	T
Wood stork (Mycteria americana)	E	E
Florida sandhill crane (Grus canadensis pratensis)	T	
Florida scrub jay (Aphelocoma coerulescens)	T	T
American alligator (Alligator mississippiensis)	SSC	T
Eastern indigo snake (Drymarchon corais)	T	T
SE American kestrel (Falco sparverius paulus)	T	
Gopher tortoise (Gopherus polyphemus)	SSC	
Gopher frog (Rana capito)	SSC	
Sherman's fox squirrel (Sciurus niger shermani)	SSC	
Little blue heron (Egretta caerulea)	SSC	
Snowy egret (Egretta thula)	SSC	
White ibis (Eudocimus albus)	SSC	

D. Forest, Mineral, Scenic and Water Resources

1. Forest Resources: Pine timber is poorly stocked, and generally of low quality throughout the area. Although no timber was cut during ownership by the Carltons, most pine stands were clearcut or high-graded by previous owners, and have regenerated poorly. Hardwood stands also show evidence of exploitation. However, hardwood basal areas may still exceed 90 square feet in selected stands. Sustained commercial harvests of forest products, especially softwood saw-timber and pulpwood, is currently impractical on HMWMA. A forest resource management plan for HMWMA has been developed with assistance from the Florida Department of Agriculture and Consumer Services, Division of Forestry (Appendix XIV). The focus of this plan is improvement of wildlife habitats and plant community restoration.

Florida Statutes Section 253.036 requires management plans for parcels greater than 1,000 acres to contain an analysis of multiple-use potentials. At the lead managing agency's discretion, this may include a professional forester's assessment of the resource conservation and revenue-producing potentials of the property's forests. As a matter of policy for all forested lands under FWC management no sustainable (commercial) forestry practices are planned or implemented on lands managed for wildlife unless they accomplish a habitat improvement objective. In pursuit of this objective 70 acres of offsite planted slash pine will be selectively cut on HMWMA. In addition, long leaf pine stands will be thinned as needed to improve wildlife habitat. These operations, and the sale of the harvested timber, will be coordinated as per management agreement by DOF's Forest Management Bureau.

2. Mineral Resources: Quantitative estimates or measures of mineral resources are unavailable. Any previous exploratory reconnaissance for minerals on HMWMA is unknown. However, sub-economic limestone reserves, deposits of phosphate, sand, and clay occur in the vicinity (Florida Department of Environmental Regulation, 1982). Subsurface interests on the area are restricted by two title encumbrances, mentioned previously.

3. Scenic Resources: Resources of note within area boundaries would certainly include Mill Creek, a scenic tributary to the Withlacoochee River. The creek enters HMWMA from the east in Section 20, running west approximately 1 mile to Section 30 where it turns southwest, joining the SWFWMD property.

4. Water Resources: HMWMA lies within the Northern West-Central Florida Ground-Water Basin, a 4,500-square-mile basin delineated by the axes of the Pasco, Green Swamp, Keystone, and Bronson potentiometric highs (SWFWMD, 1987). The Floridan Aquifer is the primary aquifer system, and major source of water for human consumption. Limestone of the Upper Floridan Aquifer may be seen at the surface on the area. Here both direct discharge and/or recharge via rainfall may occur. A small net recharge to the aquifer system occurs in the vicinity of HMWMA, averaging 2-10 inches per year (Stewart, 1980).

The management area is encompassed by the Withlacoochee River surface-water drainage basin, with a drainage area of approximately 1,980 square miles (SWFWMD, 1987). Excepting Mill Creek, which derives flow from aquifer discharge and direct runoff, and several man-made ditches, surface drainage is not evident on the area.

In addition to Mill Creek, surface water bodies include paludal systems with widely varying hydroperiods and total area coverage. Although no significant recharge derives from these areas, these systems provide flood water conveyance, allow ground-water discharge, and, generally, improve water quality.

River and lake systems designated as Outstanding Florida Waters in proximity to HMWMA include:

a. The Withlacoochee River downstream of State Road 33 in Lake County to eastern section line of Section 33, Township16 South, Range 18 East.
a. The lower Withlacoochee River, from the Gulf of Mexico to the Cross Florida Barge Canal By-Pass Spillway, but not including that portion of the river between Lake Rousseau and the Cross Florida Barge Canal.
b. The Little Withlacoochee River.
c. Jumper Creek downstream of State Road 35, including Jumper Creek Swamp.
d. Gum Springs, Gum Slough (Dead River), and Gum Swamp.
e. Lake Panasoffkee, Outlet River, Little Jones Creek, Big Jones Creek, and Rutland Creek.
f. Shady Creek downstream of State Road 468, including Warm Spring Hammock.

g. Lake Tsala Apopka.

HMWMA is not a designated aquatic preserve and is not under study such designation. The lands within HMWMA are not designated as an area of critical state concern, nor are they under study for such designation.

E. Archaeological and Historic Resources

The Florida Department of State, Division of Historic Resources (DHR), lists five historic sites, four former homestead sites and one cemetery, in the Florida Master Site File for HMWMA (Figure 7). Site reference numbers and names are as follows:

8Sm123	Hodge Place
8Sm124	Welch Place
8Sm125	McKinney Place
8Sm126	Alto Cemetery
8Sm127	Unnamed Former House.

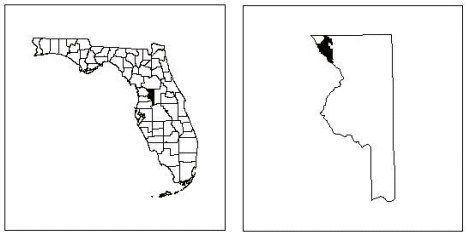
The McKinney house was one of the first homesteads on the area, and was settled about 1916. Open pastures, which the McKinneys cleared for raising cattle, can still be found to the northwest of the old homestead.

No prehistoric archaeological sites are recorded for the area. Although no systematic survey has been conducted on the area, the probability of site discovery is low (B. Weisman, CARL Archaeological Survey - pers. comm.). Despite the density of sites nearby, especially west across the Withlacoochee River, an apparent void exists east of the river in the immediate vicinity of HMWMA (Weisman and Marquardt, 1988). The area may have been part of a cultural buffer zone and largely lacked the physiographic juxtaposition and environmental conditions (e.g., uplands immediately adjacent to lacustrine and major riverine systems) preferred by aboriginal peoples (Weisman and Marquardt, 1988). Nevertheless, small prehistoric sites may exist on the area. Their Master Site recording, assessments, and preservation strategies will be coordinated with DHR immediately upon discovery.

Half Moon

Wildlife Management Area
(9,480 Acres)
Sumter County, Florida.

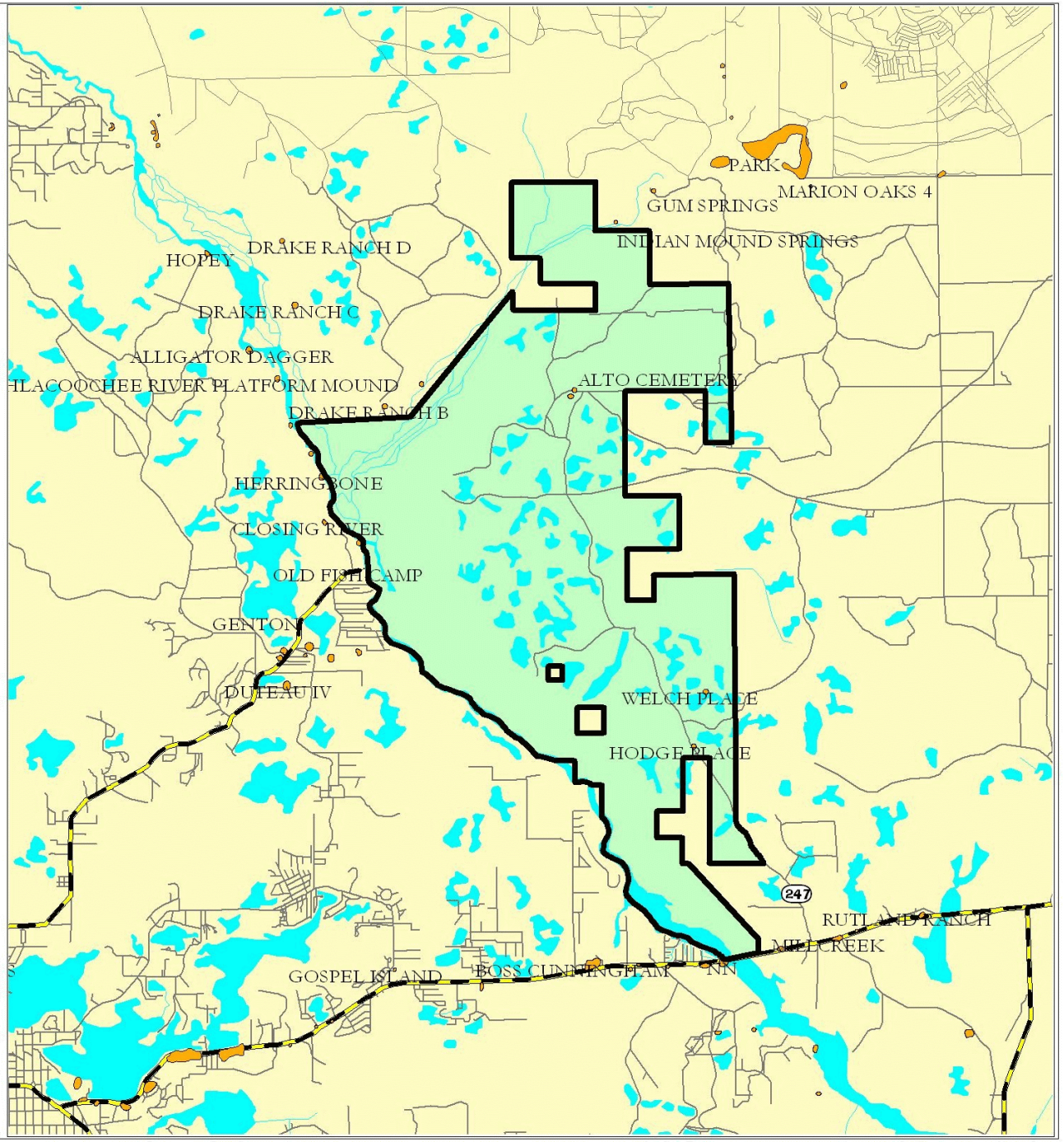
Figure 7: Cultural resources



Legend

- Boundary
- Cultural resource
- Major road
- Road
- Major water body
- Half Moon WMA

1 0 1 Miles



Guidelines delineated by "Management Procedures For Archaeological and Historic Sites and Properties On State-Owned or Controlled Lands" (Appendix VIII) will be followed to ensure preservation and protection of archaeological resources. "Recommendations for the Management of Archaeological and Historical Resources on the Carlton Half Moon Wildlife Management Area" (Appendix VII) and future consultation with DHR-CARL Archaeological Survey will guide management of certain specific cultural resources of the area.

III. USAGE OF THE PROPERTY

A. Previous Use and Development

HMWMA lies in northwestern Sumter County, an area with settlement patterns not unlike those of neighboring counties. Sumter County was established by an act of the state legislature in 1853 (Yamataki et. al., 1988). It was named after General Charles Sumter, one of the partisan leaders of the American Revolution (Richmond, 1882). The county was formed from a large area of what was previously Marion County, and a part of what is now Lake County. (Yamataki et. al., 1988). Many of the original settlers emigrated from South Carolina during the 1840's. They secured land grants from the federal government as compensation for volunteer service in the Seminole Wars and under the Armed Occupation Act of 1842. This act encouraged the settlement of lands previously inhabited by Seminole Indians and served as the initial driving force for European settlement in Sumter County. In exchange for the land, individuals were required to reside there for five years while bearing arms, and to cultivate crops on said properties. According to the 1860 census, 1,549 people (2 - 6 people per square mile) were residing in the county.

The population grew slowly during the early 1860's. Post Civil War settlement and the Homestead Act of 1866, which opened the public lands of Florida to homesteaders, promoted additional growth but increases in settlement patterns were slow as the cost of establishing farms was burdensome. Regardless, the county residents totaled 2,952 as of the 1870 census.

Historical accounts of settlement in the vicinity of HMWMA can be traced back to 1857, when the A. W. Rutland family emigrated from North Carolina and settled in what is now known as Rutland, Florida. Although not documented, the Rutlands likely secured a land grant from the federal government and moved to the area to take advantage of the abundant game and rich palmetto flats, the latter being particularly suited to agricultural purposes (Richmond, 1882).

Settlement of lands included within the HMWMA boundaries increased during the late 1800's as a small town named Alto was established around 1870 near the intersection of Mill Creek and Oxford Roads. The town and its one-room schoolhouse no longer exist.

Small homesteads continued to be established on HMWMA in the early 1900's. The McKinneys settled just west of Alto around 1916. One of their houses and a horse stable were removed during the interim between acquisition and the onset of management by the FWC. Lamond McKinney, now residing near Wildwood, recalls the family's primary use of the land was raising cattle (McKinney pers. comm. 1991). A 60-acre palmetto scrub pasture was cleared by hand to provide forage for their cattle. They also raised hogs of the guinea variety, and cultivated peanuts, tobacco and corn in small fields. Additionally, they planted and maintained a 50 acre plantation of pines for future harvest.

The McKinneys were not the only homesteaders on HMWMA in the early 1900's. Lamond McKinney stated that the Pendarvis family settled near Mill Creek on the west side of the present property. He also added that the Graham and Davies families settled within the vicinity. Their primary land-uses are believed to have been cattle grazing and cultivation of small plots of corn and other grains. It is likely they, as early as the 1880's, grew crops found elsewhere in the county, such as indian corn, sugarcane, oats, sweet potatoes, rice, chufas, peas and long staple cotton (Richmond, 1882). A map of these early homesteads and roads was developed from a personal interview with Lamond McKinney in 1991 (Appendix III).

Legal descriptions of the small homesteads from 1840 - 1940 do not exist, but the McKinneys continued to extend their land boundaries in the area of what is now HMWMA. According to Lamond McKinney, the property was sold to Roland A. Wilson III around 1945 because the male members of the McKinney family were obligated to war efforts and were no

longer able to participate in the family cattle business. After purchasing the property, Mr. Wilson cleared much of the palmetto scrub using a rollerchopping drum. His intentions were to open up the brush for cattle and watermelon production. Many acres south of Mill Creek are now in bahiagrass pasture due to these efforts.

In 1962, the property was purchased by the Roxby and Lambert families. No land-use activities were recorded during their ownership since they only held interest in the deed for about 14 months, after which they sold the property to Rex Farrior. This transaction took place in 1963, and is believed to be the purchase that established the property boundary configuration that exists today. It is probable that cattle production was still the primary land use. Mr. Farrior held title to the land until 1965, when he sold the deed to Audrey and Major Bellamy. Open pastures still existed, and the Bellamys took advantage of them for cattle production. Some of the land was reportedly used by the family for growing watermelons. The southernmost area of the current HMWMA was one such watermelon field. In addition to the above activities, a small hunt club, believed to be comprised of less than 10 members, was allowed to harvest deer and hogs during the Bellamy ownership period.

The Bellamys sold the property in July of 1969 to Mr. Albert and Dr. Barbara Carlton, the owners who eventually negotiated the sale to the state of Florida. Like owners preceding them, the Carltons raised cattle on existing fields, and converted more acres from palmetto scrub to improved pasture. The grasses most prominent in the improved pastures are bahia, pangola, and some hemarthia grass. Herd size reached as many as 600 head at times. In order to maintain the vitality of the cattle forage, the Carltons used prescribed fire and fertilization of the fields.

Other land-use activities were implemented by the Carltons as additional sources of income. Bahiagrass sod was harvested in alternating strips in some pastures to supplement the income from cattle. This sod stripping activity continued for several years, even after the Carltons had transferred their grazing rights.

Beginning in the early 1980's a hunt club leased the tract for deer hunting (Lewis P. Mann, former club member, pers. comm., 1992). A cattle lease was initiated in the last 6 years

of the Carlton's ownership. Lease holder Greg Bingham reportedly ran about 300 head of cattle. HMWMA was grazed by Mr. Bingham until February 1990.

B. Public Use Current and anticipated resource uses of the property are diverse. There are opportunities for hunters and fishermen as well as for other outdoor enthusiasts. Due to the proximity of population centers in Sumter, Citrus, and Marion counties, public use can be expected to increase as public awareness of opportunities increases. Annual utilization of HMWMA is estimated to be 3,000 user-days for all activities combined. The FWC administers hunts in the fall and spring for various game species, including small game, deer, turkey and feral hogs.

No active fish management program is presently being implemented. However, fish management opportunities for largemouth bass, sunfish, and catfish do exist in some of the ponds due to previous land management activities. Annual angler utilization is estimated to be less than 50 angler-days.

There are opportunities for a variety of other nature-based recreation activities on HMWMA. The area offers excellent opportunities for bird watching, especially for wading birds since they are regularly observed utilizing the edges of freshwater marshes and ponds. 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, sightseeing and horseback riding.

C. Responsibilities

The FWC is responsible for operation of the WMA as a provision in the lease agreements with the Trustees (Appendix I) and the SWFWMD (Appendix II). All requirements of the Management Procedures document (Appendix VIII) from the DHR will be followed with regard to any ground-disturbing activities.

D. Assessment of the Impact of Planned Uses

1. Public uses: Currently, the HMWMA is being used for nature-based recreational activities including quality-oriented public hunting, hiking, and wildlife viewing. Public hunting has been conducted on the area since 1990. All hunting has been managed by restricting the number of hunt periods, maintaining daily hunter numbers, and conducting only quota hunts for deer, hogs, turkeys and small game. It is the policy of the FWC, as expressed in the Agency Strategic Plan, to provide, on lands it owns or manages, a diversity of recreational opportunities which are fish and wildlife oriented, and which do not adversely impact the long-term well-being of fish and wildlife populations or habitats. Such opportunities are developed based upon public interests, usually as expressed during public involvement efforts of the agency (see Appendix X). Uses planned for HMWMA comply with the Conceptual State Lands Management Plan, and represent "balanced public utilization".

2. Determination of Public Uses that are Consistent with Acquisition Purposes: Since no prospectus was required or prepared in the early days of land acquisition, when HMWMA was purchased, the "recommended public purpose" and "management summary" from the 1990 CARL Report, are presented in lieu of a management prospectus (Appendix XVI). The FWC intends to continue to manage the HMWMA as a multiple-use property within the guidelines of the CARL Program, and to advocate the specific uses described within the CARL Management Summary document.

E. Acreage that should be declared surplus

No portion of HMWMA should be considered or declared surplus.

F. Proposed Single- or Multiple-Use Management

The HMWMA will be managed under the multiple-use concept, to maintain water quality, restore natural hydroperiods, retain the high-quality wildlife habitat, and to restore and maintain the natural condition of the native plant communities. Other uses will be to provide natural resource-based education and recreation. The FWC has developed goals and objectives for the HMWMA in order to state the specific intentions of the agency as guided by the FWC Agency Strategic Plan, 1999-2004.

Analysis of Multiple-use Potential - The following actions or activities have been considered under the multiple-use concept as possible uses to be allowed on the WMA. "Approved" uses are deemed to be in concert with the purposes for state acquisition, with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals and objectives as expressed in the Agency Strategic Plan and Priorities documents . "Rejected" means the item is not in concert with one or more of these various forms of guidance available for decision-making:

Analysis of Multiple-use Potential

	Approved	Rejected
• Protection of endangered and threatened species	✔	
• Ecosystem maintenance	✔	
• Soil and water conservation	✔	
• Hunting	✔	
• Fishing	✔	
• Wildlife observation	✔	
• Hiking	✔	
• Bicycling	✔	
• Horseback riding	✔	
• Timber harvest	✔	
• Cattle grazing	✔	
• Camping		✔
• Apiaries		✔
• Linear facilities		✔
• Off road vehicle use		✔
• Environmental education	✔	
• Citriculture or other agriculture		✔
• Preservation of archeological and historical sites	✔	
• (Other uses as determined on an individual basis)	✔	

IV. ACCOMPLISHED OBJECTIVES FROM THE 1996 HALF MOON CONCEPTUAL MANAGEMENT PLAN

Accomplished Objectives from the 1996 Half Moon Conceptual Management Plan Resource Management Goals and Objectives:

		Percent and date accomplished
Goal 1:	**Preserve naturally occurring habitats, restore most man-modified habitats, and protect natural resources.**	
Objective 1:	Inventory flora and fauna.	60% 12-98
	Comments: This objective was only partially accomplished due to limited resources. Hiring an outside source for a botanical survey is planned.	
Objective 2:	Implement an all-season prescribed burning program	74% 02-00
	Comments: Due to fuel loading, dormant-season burns are desirable before growing-season burns are initiated. We have only recently begun a burn rotation (i.e. second burn since state ownership) and growing-season burns are now a high priority.	
Objective 3:	Utilize chemical treatments to facilitate restoration of historical plant communities and control encroachment by exotic plant species.	100% 10-00
Objective 4:	Establish a replanting program of historically occurring species on most ruderal sites (those not maintained as wildlife openings, food plots or dove fields).	100% 02-98
Objective 5:	Restore historical hydrological processes by filling man-made ditches and excavated water-holding pits, and installing water control structures as needed.	50% 04-00
	Comments: Recreational fishing opportunities have warranted the retention of some water-holding pits.	

Objective 6:	Integrate game species management with restoration and preservation efforts.	100% 05-97
Objective 7:	Coordinate with Division of Forestry in the development of a forest management plan that primarily benefits wildlife.	100% 01-00
Objective 8:	Restore and maintain integrity of habitats with prescribed burning, selective thinning, rollerchopping, and other mechanical means as necessary	100% 10-00
Objective 9:	Control public access to minimize adverse environmental impacts, including limiting vehicle types, periods of access, public use roads and trails and restricting boat propulsion on Gum Slough Run. Comments: Restricting motor boats on Gum Slough has been hampered by removal of the sign by vandals. This restriction must be implemented via signage by DEP.	90% 10-00
Objective 10:	Control exotic plant and animal species as necessary	100% 10-00

Goal 2: Manage plant and wildlife resources for diversity and productivity.

Objective 1:	Emphasize management for threatened and endangered plant and wildlife species where they occur.	100% 10-00
Objective 2:	Manage sportfish on a optimum-sustained use basis in selected ponds by limiting access and stocking as required. Comments: Stocking of ponds was not cost-effective relative to interest by local anglers.	80% 01-97
Objective 3:	Maintain or increase nongame wildlife populations by providing artificial nest cavities, identifying and	100% 10-00

protecting existing snags, and maintaining wetlands and their associated hydroperiods for wading bird usage.

Objective 4:	Utilize cattle grazing, at reduced stocking levels, to assist restoration efforts and to manage understory plant succession rates.	100% 10-98
Objective 5:	Monitor the status of selected bird, mammal, amphibian and reptile species through accurate inventories and develop management strategies and recommendations	100% 10-00
Objective 6:	Scrub-jays: Maintain or increase the relative abundance of scrub-jays through mechanical habitat manipulation, prescribed burning, and replanting oak scrub in sites which previously possessed such species.	100% 10-00
Objective 7:	Gopher tortoises: Monitor density through systematic burrow surveys to evaluate success of fire management program. Comments: This objective was only partially completed due to limited resources.	10% 10-00

Goal 3: Maintain game wildlife species and manage to provide a high quality hunting experience on a sustained yield basis.

Objective 1:	Determine those factors, through surveys and/or questionnaires, which hunters feel best define a high quality hunting experience.	100% 01-97
Objective 2:	Evaluate responses to surveys and/or questionnaires and determine feasibility of changing hunt formats to address respondents needs and concerns.	100% 10-99

Objective 3:	Establish wildlife openings, food plots and dove fields on previously disturbed sites such as improved pastures.	100% 01-96

Goal 4: Provide multiple consumptive and non-consumptive recreational opportunities for users while limiting adverse impacts on the resource.

Objective 1:	Identify and resolve user conflict by temporal or spatial segregation of incompatible recreational activities.	100% 10-00
Objective 2:	Provide interpretative center, informational pamphlets, and interpretative signs on trails to inform visitors and enhance visitor experience.	10% 10-00
Objective 3:	Provide hiking, biking, and equestrian trails, in previously disturbed sites. Comments: Although access to hikers, bikers and equestriennes is provided, no trails have been defined due to limited resources.	0% 10-00
Objective 4:	Establish carrying capacity for non-consumptive uses, if necessary, to maintain a quality outdoor experience while protecting natural resources. Comments: Due to moderate recreational use, a carrying capacity was not deemed necessary to establish.	10% 10-00
Objective 5:	Provide law enforcement for all recreational uses to prevent potential environmental damage by area users.	100% 10-00
Objective 6:	Obtain data on effort expended by fishermen on the area with surveys or sign-in boxes.	100% 01-96
Objective 7:	Collect quantifiable data on game wildlife species to determine population indices and physical conditions to establish man-days of use and harvest levels compatible with sustained yields.	100% 01-96

V. RESOURCE MANAGEMENT GOALS AND OBJECTIVES

The following goals and objectives have been developed specifically for HMWMA. They represent ideas of FWC biological and technical staff as well as those of stakeholders from outside the FWC. Many of the goals and objectives below help accomplish agency objectives expressed in the Agency Strategic Plan. Target dates for completion of objectives represent the end of the calender year.

<u>Goal 1</u>: Preserve naturally-occurring habitats, restore selected man-modified habitats, and protect natural and cultural resources.

Objective 1. **By 2001**, investigate the feasibility of regulations to restrict motorized boats on Gum Slough.

Objective 2: **By 2001**, coordinate with the Department of State's Division of Historical Resources to schedule additional cultural resource surveys for the portions of HMWMA not previously surveyed.

Objective 3: **By 2002**, meet with SWFWMD to pursue management authority for sovereignty submerged lands.

Objective 4: In order to enhance or restore native wildlife habitats, **by 2003** implement selective timber removal, based on recommendations from the Division of Forestry's Forest Management Plan for HMWMA.

Objective 5: Contract with FNAI for a botanical survey **by 2004**.

Objective 6: Fill four man-made ditches **by 2004**.

Objective 7: Complete a comprehensive bird survey **by 2005**.

Objective 8: Continue to implement an all-season prescribed burning program for maintenance of native plant communities (**ongoing**).

Objective 9: Continue to establish native vegetation on selected ruderal sites (**ongoing**).

Objective 10: Accommodate research to determine the most effective methods for restoring and sustaining native plant and animal communities (**ongoing**).

Objective 11: Continue to use chemical and mechanical means to restore plant communities and control exotic plants (**ongoing**).

Objective 12: Continue to identify, monitor, and protect cultural resources **(ongoing)**.

<u>Goal 2</u>: Manage plant and wildlife species composition for diversity and productivity.

Objective 1: Update the scrub jay management plan (Appendix XIV) **by 2001**.

Objective 2: Begin implementation of the updated scrub jay management plan **by 2001**.

Objective 3: Monitor gopher tortoise density through systematic burrow surveys (establish transects **by 2001**).

Objective 4: Update the prescribed burn plan **by 2001**.

Objective 5: Continue to use prescribed fire, mechanical and chemical treatments, and cattle grazing to manage understory plant succession (**ongoing**).

Objective 6: Manage the land to promote native plant communities (**ongoing**).

Objective 7: In order to supplement natural nesting substrate, continue providing artificial nest cavities for species such as wood ducks, bluebirds and American kestrels (**ongoing**).

Objective 8: Continue to monitor the effects of cattle grazing on native plant communities (**ongoing**).

<u>Goal 3</u>: Manage game wildlife species on a sustained-yield basis to provide a high quality hunting experience.

Objective 1: **By 2001,** evaluate the need for additional hog hunts.

Objective 2: **By 2001,** determine the efficacy of extending the small game hunting season.

Objective 3: Establish additional food plots and dove fields on select, previously disturbed sites **by 2004**.

Objective 4: Maintain current wildlife openings (**ongoing**).

<u>Goal 4</u>: Provide multiple nature-based recreational opportunities for users, while limiting adverse impacts on resources.

Objective 1: Design, publish, and distribute a multi-purpose trail and interpretive brochure **by 2002**.

Objective 2: Design and build a wildlife viewing structure **by 2005**.

Objective 3: Evaluate the feasibility of increasing public access by the issuance of special day-use permits **by 2005**.

Objective 4: Continue to provide hiking, bicycling and equestrian opportunities (**ongoing**).

Objective 5: Continue to monitor game populations of whitetail deer, bobwhite quail, and feral hog to help guide game management decisions (**ongoing**).

<u>Goal 5</u>: Increase public education programs.

Objective 1: **By 2001**, provide four interpretive signs to educate the public regarding projects which monitor both cattle grazing and native ground cover restoration.

<u>Goal 6</u>: Pursue acquisition of additions, inholdings, and title encumbrances.

Objective 1: **By 2001,** develop a GIS shape file, acreage, and other necessary data to nominate parcels for the FWC Inholdings and Additions Program.

Objective 2: **By 2005**, seek funding for the purchase of oil, gas, mineral, and subsurface rights and interests held by M.B. Rudman and James G. Allison.

Objective 3: Annually review the nomination status of prospective HMWMA acquisition(s) under the FWC inholdings and additions program (**ongoing**).

Goal 7: Facilitate better management by improving the infrastructure of HMWMA.

Objective 1: Construct an equipment storage facility **by 2005**.

V. RESOURCE MANAGEMENT PROBLEMS AND STRATEGIES

Problem A: **Past human activities have altered historic plant and animal communities.**

Strategy: Continue an ecologically-driven prescribed burning program over the entire tract, as expressed in the prescribed burn plan (Appendix IX).

Strategy: Restore selected sites using the best available techniques.

Strategy: Manage timber to benefit wildlife and restore native communities using the guidelines found in the Division of Forestry's Forest Management Plan for HMWMA.

Strategy: In order to manage plant succession and maintain wildlife habitat diversity, contract with a cattleman to stock cattle at a rate not to exceed the rates recommended by NRCS grazing specialists (Appendix XV).

Problem B: **The adjacent Ventura Ranch contains a parcel of scrub habitat that is contiguous with existing scrub on HMWMA. In order to assure the long-term welfare of the scrub jay population, this parcel should be protected and/or acquired.**

Strategy: Continue to offer technical assistance to Ventura Ranch land managers on the management and protection of scrub habitat.

Strategy: Work with FWC acquisition agents to facilitate purchase of this parcel.

Problem C: **As recreational uses increase, conflicts may arise between or among user groups.**

Strategy: Establish a hiking trail open only to foot traffic.

Strategy: Establish temporal or spatial separation of activities as necessary.

Problem D: **Exotic plant species, such as cogongrass, exist on HMWMA, and pose a potential problem to wildlife habitats.**

Strategy: Identify areas of cogongrass, as well as other exotic species, and eradicate them as early as possible to avoid a larger exotic control problem.

Problem E: **Portions of HMWMA have been added to the property subsequent to the original cultural survey conducted by the Department of State's Division of Historical Resources, and therefore have not been surveyed for cultural resources.**

Strategy: Coordinate with the Department of State's Division of Historical Resources to schedule a cultural resource survey for portions not currently surveyed, and do likewise for any future acquisitions.

Problem F: **Oil, gas, mineral, and subsurface rights and interests on HMWMA are currently held by private individuals.**

Strategy: Seek a funding source and pursue acquisition of these rights and interests.

VI. MANAGEMENT ACTIVITIES AND INTENT

A. Land Use and Cooperating Agencies

HMWMA was purchased through the CARL program under the "other lands" classification. The intent for purchase of lands under the CARL program was to conserve outstanding examples of Florida's natural and historical resources. The FWC manages and protects existing natural habitats, and intends to restore altered sites (those not maintained as wildlife openings, food plots or dove fields) to native vegetation types.

Since the acquisition of the tract the area has been managed as described in the HMWMA Conceptual Management Plans developed by the FWC, and approved by the Trustees. Management activities have included prescribed burning, wildlife surveys, administration of hunts, removal of fencing, road maintenance, and maintenance and improvement of existing facilities.

Several agencies provide technical assistance for area management. These include the Division of Forestry (DOF) (forest resources), DHR (historical resources) and SWFWMD (water resources). Additionally, SWFWMD and FWC have the previously-mentioned lease agreement adding 4021 acres of land (primarily river swamp) to the area.

B. Vegetation Management Intent

Vegetation on the area is dominated by a mixture of fire-dependent or fire-adapted communities, including scrubby and mesic flatwoods, sandhill pineland, hammocks, and a variety of wetlands that require frequent fire for maintenance. Fire management goals will focus on the need to restore and maintain these communities, restore and maintain habitat for Florida scrub-jays, and increase diversity both within and among community types. Prescribed fire has initially been used to reduce hazardous fuels, and to prepare disturbed sites for reforestation efforts. When consistent with the above goals, fire intervals are selected randomly from weighted community-specific interval ranges. Specific season of fire application is weighted 2:1 towards growing season burns (see Appendix IX, burn plan previously approved by LMAC).

Establishment of exotic bahiagrass pastures, planted and fertilized to increase cattle carrying capacities above that of native range, has resulted in reduction of the values associated with native wildlife habitats. It is the intent of the FWC to remove bahiagrass pastures, or other exotic grasses, and restore native understory species. HMWMA is currently a FWC study site for native groundcover restoration. The FWC will continue to monitor the effects of cattle grazing on the plant and animal communities. Information gained through monitoring efforts will be used to modify future stocking rates as necessary.

Specific roads, trails, and parking areas have been designated to reduce unregulated traffic, prevent damage to plant communities, and to minimize impacts on sensitive wildlife habitats. Public use roads are repaired or upgraded to enhance all-weather capabilities, further minimizing vehicular impacts on habitats. All other roads are closed to unauthorized vehicles, and roads not needed for management purposes (i.e. law enforcement, biological surveys, fire

management, non-vehicular trails) are actively restored or allowed to revert to historic vegetative species and communities.

A Timber Management Assessment (Appendix XV) has been developed to enhance flatwoods restoration on ruderal sites. This document addresses planting of both overstory and midstory vegetation. Site preparation is accomplished with prescribed fire or chemical treatments where appropriate. Plantings are executed in a manner whereby resulting vegetation patterns do not suggest artificial forest regeneration. Restoration of these sites benefits a wide variety of wildlife species, including Florida scrub-jays, and provides visitors with an enhanced opportunity to view historic landscapes. The Timber Management Assessment plan has been developed in cooperation with the DOF, and is being implemented as reforested and natural stands mature. This plan addresses stocking rates, stand ages and timber harvest strategies to maximize benefits to wildlife. The native groundcover restoration study may provide techniques for near-complete plant community restoration.

Approximately 200 acres of wildlife openings, food plots or dove fields are to be maintained on previously disturbed sites. These sites will benefit many wildlife species by creating ecotones. These areas also offer added human recreational and aesthetic benefits. Native species are planted whenever feasible, but non-invasive agronomic plants will be considered when their use is necessary to accomplish recreational and wildlife objectives.

Many wetlands on the area were impacted by previous land management (ditched, drained, excavated) to enhance grazing and provide permanent water sources for livestock. Selected ditches and canals draining wetlands are to be filled with soil to approximate historic hydroperiods. Reforestation of upland sites is being accomplished in order to establish and maintain water quality.

C. Wildlife and Fisheries Management Intent

A variety of wildlife management techniques are utilized to enhance and sustain a diversity of species. Game species are managed on a sustained-yield basis. To accomplish this, population surveys are conducted to determine species densities. These data will be used to help managers in recommending appropriate harvest levels. Based on this information hunting

pressure is adjusted to optimize levels of hunting opportunity and harvest without diminishing the quality of the hunting experience. Furthermore, biological data on game species are collected at check stations to determine sex, age, body weights, parasite burdens, reproduction rates and body fat estimates.

Threatened or endangered species, and species of special concern are monitored to detect changes in relative abundance and distribution. Management practices in scrub habitats are designed to benefit Florida scrub-jays, which also benefits other early successional scrub endemics. Scrub is managed with prescribed fire or roller chopping where appropriate, in a manner which does not interfere with scrub jay nesting, and which provides sufficient habitat for birds displaced by management actions designed to enhance the habitat.

D. Recreation Management Intent

Management of fish and wildlife resources provides a diversity of nature-based recreational opportunities. Public hunting programs will be managed utilizing a sustained-yield concept. Management of other recreational opportunities follows an optimum user carrying capacity concept to prevent degradation of the outdoor experience and excessive damage to wildlife habitats. Hiking, bicycling, and horse trails are being established, along with designated observation points. A self-service interpretative program has been established to provide visitors with information on the area and its resources. These facilities also provide opportunities for nature study, photography, and wildlife observation.

Archaeological and historic sites are protected according to guidelines established by the DHR (Appendix VIII).

Vehicular access is closely regulated and limited to restricted roads and designated parking areas. Airboats, tracked vehicles, motorcycles, and all-terrain vehicles are prohibited. Boat propulsion on Gum Slough Run is limited to manual means (paddles or oars) and electric motors of no more than 3 HP.

When the managed area reaches final configuration, and within budgetary constraints, the upland perimeter of the area will be fenced. This will provide improved boundary definition for visitors, contain cattle within the area, and enhance area security and resource protection.

E. Cost estimates and funding sources for conducting management activities

The following represents the actual and unmet budgetary needs for managing the lands and resources of HMWMA. This budget was developed using data developed by FWC and other cooperating entities, and is based on actual costs for land management activities, equipment purchase and maintenance, and for development of fixed capital facilities. The budget below, although far exceeding what FWC has been receiving through the appropriations process, is consistent with the direction taken by current operational planning for Half Moon WMA (see Appendix XI):

Half Moon WMA Conceptual Management
Projected Budget
Maximum expected single-year expenditure

Resource Management	
Burning	$11,566.04
Exotics	$75,832.00
Planting	$12,322.70
Surveys	$11,150.00
Repl. Equip.	$30,835.00
Mgt. T.A.	$0.00
Rd/Trl Dev.	$136,532.41
Resource Protection	$2,282.24
Equip.	$79,224.00
Hydrologic Restoration	$4,475.00
Subtotal	**$364,219.39**
Visitor Services/Recreation	
Fac. Maint.	$0.00
Bldg. maint.	$516.00
Fence/Gate maint.	$13,786.00
Signage	$159.49
Res. maint.	$0.00
Rd./Trl. maint.	$41,877.24
Fence/Gate Dev.	$275,720.00
Subtotal	**$332,058.73**
Capitol Improvements	
Bld. Dev.	$230,000.00
Fac. Dev.	$0.00
Subtotal	**$230,000.00**
Administration *	
General admin.	$455,390.95
Area staff	$42,638.80
Subtotal	**$498,029.75**
Immediate subtotal	$790,729.39
Intermediate subtotal	$626,821.24
Other subtotal	$4,475.00
Total	**$1,424,307.87**

Budgetary time-frame:
Immediate Priority: Annual or 0-2 years
Intermediate Priority: 3-4 years
Other: 5+ years

* **Note:** Administration figures represent historic FWC activity groupings. During this planning cycle these figures will be made consistent with the Land Management Uniform Cost Accounting Council-approved activity categories and sub-categories.

Half Moon WMA
Projected Budget
Five-year projection

Resource Management	
Burning	$57,830.19
Exotics	$379,160.00
Planting	$61,613.50
Surveys	$55,750.00
Repl. Equip.	$154,175.00
Mgt. T.A.	$0.00
Rd/Trl Dev.	$682,662.07
Resource Protection	$11,411.20
Equip.	$79,224.00
Hydrologic Restoration	$4,475.00
Sub total	**$1,486,300.96**

Visitor	
Fac. Maint.	$0.00
Bldg. maint.	$2,580.00
Fence/Gate maint.	$68,930.00
Signage	$797.43
Res. maint.	$0.00
Rd./Trl. maint.	$41,877.24
Fence/Gate Dev.	$275,720.00
Sub total	**$389,904.68**

Capitol Improvements	
Bld. Dev.	$230,000.00
Fac. Dev.	$0.00
Sub total	**$230,000.00**

Administration *	
General admin.	$1,090,117.83
Area staff	$213,194.00
Sub total	**$1,303,311.83**
Immediate subtotal	$2,553,616.03
Intermediate subtotal	$626,821.24
Other subtotal	$4,475.00
Five-year Grand Total	**$3,409,517.47**

Budgetary time-frame:	
Immediate Priority:	Annual or 0-2 years
Intermediate Priority:	3-4 years
Other:	5+ years

Budget schedule:		
FY 2000-2001	$496,302.40	Immediate
FY 2001-2002	$496,302.40	Immediate
FY 2002-2003	$1,417,729.62	Immediate and Intermediate
FY 2003-2004	$496,302.40	Immediate
FY 2004-2005	$502,880.65	Immediate and Other
Five-year Grand Total	**$3,409,517.47**	

* **Note:** Administration figures represent historic FWC activity groupings. During this planning cycle these figures will be made consistent with the Land Management Uniform Cost Accounting Council-approved activity categories and sub-categories.

F. Analysis of Potential for Contracting Restoration and Management Activities by Private Vendors

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 "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. "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 :

	Approved	**Conditional**	**Rejected**
• Road development and maintenance		✔	
• Dike and levee maintenance		✔	
• Prescribed burning		✔	
• Vegetation inventories	✔		
• Timber harvest activities		✔	
• Public contact and educational facilities development		✔	
• Exotic species control		✔	

G. Compliance with State and Local Government Requirements

Uses planned for the WMA 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 III). Such uses also comply with the authorities of the Commission 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, 373, 375, 378, 487, and 597 of the Florida Statutes. A letter from Sumter County, indicating County review of this CMP for compliance with the local government comprehensive plan, may be found in Appendix XII.

H. Land Management Review

Pursuant to Florida Statute Chapter 259.036, the FWC shall consider the findings and recommendations of the Land Management Review Team in finalizing the required 5-year update of its management plan. At the time of this plan's drafting, a Land Management Review of HMWMA had not been performed, and therefore the FWC was unable to incorporate any review findings or recommendations into this plan.

I. Soil and Water Resource Conservation

Soil disturbing activities will be confined to areas that have the least likelihood of experiencing erosion problems (e.g., steepest slopes and streamside management zones). Soil disturbing activities will follow landform contours to the extent practicable. On areas that have been disturbed prior to state 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.

VII. LITERATURE CITED

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Healy, H. G. 1975. Terraces and shorelines of Florida. Florida Bureau of Geology, Map Series No. 71.

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IX. APPENDICES

APPENDIX I

Trustees lease agreement

APPENDIX I

SAL8103

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

LEASE AGREEMENT

Lease No. 3789

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

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

NOW, THEREFORE, this lease is made and entered into this 18th day of December, 1989, between the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred to as "LESSOR", and the STATE OF FLORIDA GAME AND FRESH WATER FISH COMMISSION, hereinafter referred to as "LESSEE",

WITNESSETH:

The parties, for and in consideration of mutual covenants and agreements hereinafter contained, hereby covenant and agree as follows:

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

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

3. TERM: The term of this lease shall be for a period of fifty (50) years, commencing on December 18,1989 and ending on December 17,2039, unless sooner terminated pursuant to the

provisions of this lease.

4. PURPOSE: LESSEE shall manage the leased premises only for the conservation and protection of natural and historical resources and resource based public outdoor recreation which is compatible with the conservation and protection of these public lands, as set forth in subsection 253.023(11), Florida Statutes, along with other related uses necessary for the accomplishment of this purpose as designated in the Management Plan required by paragraph 7 of this lease.

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

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

7. MANAGEMENT PLAN: LESSEE shall prepare and submit a Management Plan for the leased premises, in accordance with Section 253.034, Florida Statutes, and Chapters 18-2 and 18-4, Florida Administrative Code, within 12 months of the effective date of this lease. The Management Plan shall be submitted to LESSOR for approval through the Division of State Lands. The leased premises shall not be developed or physically altered in any way other than what is necessary for security and maintenance of the leased premises without the prior written approval of LESSOR until the Management Plan is approved. The Management Plan shall emphasize the original management concept as approved by LESSOR at the time of acquisition which established the primary public purpose for which the leased premises were acquired. The approved Management Plan shall provide the basic guidance for all management activities and shall be reviewed jointly by LESSEE and LESSOR at least every five (5) years. LESSEE shall not use or alter the leased premises except as provided for in the approved Management Plan without the prior written approval of LESSOR. The Management Plan prepared under

this lease shall identify management strategies for exotic species, if present. The introduction of exotic species is prohibited, except when specifically authorized by the approved Management Plan.

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

9. INSURANCE REQUIREMENTS: LESSEE shall procure and maintain adequate fire and extended risk insurance coverage for any improvements or structures located on the leased premises in amounts not less than the full insurable replacement value of such improvements by preparing and delivering to the Division of Risk Management, Department of Insurance, a completed Florida Fire Insurance Trust Fund Coverage Request Form immediately upon erection of any structures as allowed by paragraph 4 of this lease. A copy of said form and immediate notification in writing of any erection or removal of structures or other improvements on the leased premises and any changes affecting the value of the improvements shall be submitted to the following: Bureau of Uplands Management, Division of State Lands, Department of Natural Resources, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399.

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

11. ARCHAEOLOGICAL AND HISTORIC SITES: Execution of this lease in no way affects any of the parties' obligations pursuant to Chapter 267, Florida Statutes. The collection of artifacts or the disturbance of archaeological and historic sites on state-owned lands is prohibited unless prior authorization has

been obtained from the Department of State, Division of Historical Resources. The Management Plan prepared pursuant to Section 253.034, Florida Statutes, shall be reviewed by the Division of Historical Resources to insure that adequate measures have been planned to locate, identify, protect and preserve the archaeological and historic sites and properties on the leased premises.

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

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

14. SURRENDER OF PREMISES: Upon termination or expiration of this lease LESSEE shall surrender the leased premises to LESSOR. In the event no further use of the leased premises or any part thereof is needed, written notification shall be made to the Bureau of Uplands Management, Division of State Lands, Department of Natural Resources, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399, at least six (6) months prior to the release of all or any part of the leased premises. Notification shall include a legal description, this lease number and an explanation of the release. The release shall only be valid if approved by LESSOR through execution of a release of lease instrument with the same formality as this lease. Upon release of all or any part of the leased premises or upon expiration or termination of this lease, all improvements, including both physical structures and modifications to the leased premises, shall become the property of LESSOR, unless LESSOR gives written notice to LESSEE to remove any or all such improvements at the expense of LESSEE. The decision to retain any improvements upon termination of this lease shall be at LESSOR'S sole discretion. Prior to surrender of all or any part of the leased premises, a

representative of the Division of State Lands shall perform an on-site inspection and the keys to any buildings on the leased premises shall be turned over to the Division. If the leased premises and improvements located thereon do not meet all conditions set forth in paragraphs 18 and 21 herein, LESSEE shall pay all costs necessary to meet the prescribed conditions.

15. BEST MANAGEMENT PRACTICES: LESSEE shall implement applicable Best Management Practices for all activities conducted under this lease in compliance with paragraph 18-2.004(1)(d), Florida Administrative Code, which have been selected, developed, or approved by LESSOR, LESSEE or other land managing agencies for the protection and enhancement of the leased premises.

16. PUBLIC LANDS ARTHROPOD CONTROL PLAN: LESSEE shall identify and subsequently designate to the respective arthropod control district or districts within one year of the effective date of this lease all of the environmentally sensitive and biologically highly productive lands contained within the leased premises, in accordance with Section 388.4111, Florida Statutes and Chapter 10D-54, Florida Administrative Code, for the purpose of obtaining a public lands arthropod control plan for such lands.

17. DUPLICATE ORIGINALS: This lease is executed in duplicate originals each of which shall be considered an original for all purposes.

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

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

20. PLACEMENT AND REMOVAL OF IMPROVEMENTS: All buildings, structures, improvements, and signs shall be constructed at the

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

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

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

23. BREACH OF COVENANTS, TERMS, OR CONDITIONS: Should LESSEE breach any of the covenants, terms, or conditions of this lease, LESSOR shall give written notice to LESSEE to remedy such breach within sixty (60) days of such notice. In the event LESSEE fails to remedy the breach to the satisfaction of LESSOR within sixty (60) days of receipt of written notice, LESSOR may either terminate this lease and recover from LESSEE all damages LESSOR may incur by reason of the breach including, but not

limited to, the cost of recovering the leased premises or maintain this lease in full force and effect and exercise all rights and remedies herein conferred upon LESSOR.

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

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

26. CONDITIONS AND COVENANTS: All of the provisions of this lease shall be deemed covenants running with the land included in the leased premises, and construed to be "conditions" as well as "covenants" as though the words specifically expressing or imparting covenants and conditions were used in each separate provision.

27. DAMAGE TO THE PREMISES: LESSEE agrees that it will not do, or suffer to be done, in, on or upon the leased premises or as affecting said leased premises, any act which may result in damage or depreciation of value to the leased premises, or any part thereof. LESSEE shall not dispose of any contaminants including, but not limited to, hazardous or toxic substances, chemicals or other agents used or produced in LESSEE'S operations, on the leased premises or on any adjacent state land or in any manner not permitted by law.

28. PAYMENT OF TAXES AND ASSESSMENTS: LESSEE shall assume full responsibility for and shall pay all liabilities that accrue

to the leased premises or to the improvements thereon, including any and all drainage and special assessments or taxes of every kind and all mechanic's or materialism's liens which may be hereafter lawfully assessed and levied against the leased premises.

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

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

31. COMPLIANCE WITH LAWS: LESSEE agrees that this lease is contingent upon and subject to LESSEE obtaining all applicable permits and complying with all applicable permits, regulations, ordinances, rules, and laws of the State of Florida or the United States or of any political subdivision or agency of either.

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

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

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

35. SPECIAL CONDITIONS: The following special conditions shall apply to this lease.

The LESSEE is hereby authorized to enter into appropriate agreements with other agencies for the conservation and protection of natural and historical resources, along with other related uses as designated in the management plan required by Paragraph No. 7 of this lease.

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

Witness

Witness

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

By: Acting (SEAL)
CHIEF, BUREAU OF UPLANDS MANAGEMENT, DIVISION OF STATE LANDS, DEPARTMENT OF NATURAL RESOURCES

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 19th day of December, 1989, by Daniel T. Crabtree as Acting Chief, Bureau of Uplands Management, Department of Natural Resources.

NOTARY PUBLIC (SEAL)

My Commission Expires:

Notary Public, State of Florida
My Commission Expires July 25, 1993
Bonded Thru Troy Fain-Insurance Inc.

Approved as to Form and Legality

By:
DNR Attorney

Witness

Witness

STATE OF FLORIDA GAME AND FRESH WATER FISH COMMISSION

By: (SEAL)
Its: Executive Director

"LESSEE"

APPROVED AS FISCALLY AND BUDGETARILLY SOUND

William C. Sumner
DIRECTOR
DIVISION OF ADMINISTRATIVE SERVICES
GFWFC

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 28th day of November, 1989, by Robert M. Brantley, as Executive Director.

Rosemary Mara (SEAL)
NOTARY PUBLIC

My Commission Expires:

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

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

Commission Attorney

Off. Sec. 392 page 96

This instrument was prepared by:
Name Paul C. Scherer, Esq.
Address 2950 Fifth Avenue No.
St. Petersburg, FL 33713

Warranty Deed (STATUTORY FORM—SECTION 689.02 F.S.)

This Indenture, Made this 11th day of August 1989, Between
W. ALBERT CARLTON, A/K/A W.A. CARLTON and BARBARA C. CARLTON, A/K/A BARBARA CARLTON, his wife

of the County of Hardee, State of Florida, grantor, and
BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA

whose post office address is C/O DEPARTMENT OF NATURAL RESOURCES, DIVISION OF STATE LANDS, Room 412, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399
of the County of Leon, State of Florida, grantee.

Witnesseth, That said grantor, for and in consideration of the sum of Ten ($10.00) and other good and valuable considerations to said grantor in hand paid by said grantee, the receipt whereof is hereby acknowledged, has granted, bargained and sold to the said grantee, and grantee's heirs and assigns forever, the following described land, situate, lying and being in Sumter County, Florida, to-wit:

See attached Schedule "A"

Documentary Stamps $ 27.40
Intangible Tax $
PAID 15th day of Aug 1989
BERNARD B. SHELNUTT, JR. CLERK
CIRCUIT COURT, SUMTER COUNTY, FLORIDA
BY [signature] D.C.

FILED AND RECORDED IN PUBLIC RECORDS OF SUMTER COUNTY, FLA. RECORD VERIFIED
Aug 15 2 43 PM '89
BERNARD B. SHELNUTT, JR. CLERK OF CIRCUIT COURT
[signature] D.C.

222494

and said grantor does hereby fully warrant the title to said land, and will defend the same against the lawful claims of all persons whomsoever, except those title matters set forth in the attached Schedule "B"

*"Grantor" and "grantee" are used for singular or plural, as context requires.

In Witness Whereof, Grantor has hereunto set grantor's hand and seal the day and year first above written.
Signed, sealed and delivered in our presence:

[signature] W. Albert Carlton W.A. Carlton (Seal)
W. ALBERT CARLTON, a/k/a W.A. CARLTON
[signature] Barbara C. Carlton (Seal)
BARBARA C. CARLTON, a/k/a BARBARA CARLTON
(Seal)
(Seal)

STATE OF NORTH CAROLINA
COUNTY OF JACKSON

I HEREBY CERTIFY that on this day before me, an officer duly qualified to take acknowledgments, personally appeared W. ALBERT CARLTON, a/k/a W.A. CARLTON and BARBARA C. CARLTON, a/k/a BARBARA CARLTON, his wife
to me known to be the persons described in and who executed the foregoing instrument and acknowledged before me that they executed the same.

WITNESS my hand and official seal in the County and State last aforesaid this 11th day of August 19 89.

My commission expires: January 6, 1990

K. Reid Bergsma
Notary Public

NOTARY PUBLIC JACKSON COUNTY, N.C.

Ref. Cases Abstract Co.

DGI

SCHEDULE "A"

The South 3/4 of Section 8, Township 18 South, Range 21 East, AND The South 3/4 of Section 7, Township 18 South, Range 21 East, AND The East 1/4 of Section 13, Township 18 South, Range 20 East, AND The South 1/4 of the West 1/2 of the Southeast 1/4 of Section 13, Township 18 South, Range 20 East, AND The South 1/4 of the East 1/2 of the Southwest 1/4 of Section 13, Township 18 South, Range 20 East, LESS that portion deeded to Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, page 689, Public Records of Sumter County, Florida; AND Section 18, Township 18 South, Range 21 East, AND The East 1/2 of the Northeast 1/4 of Section 17, Township 18 South, Range 21 East, AND The Northwest 1/4 of Section 20, Township 18 South, Range 21 East, AND The South 1/4 of Section 20, Township 18 South, Range 21 East, LESS the West 1/4 thereof; AND Section 19, Township 18 South, Range 21 East, LESS the Southeast 1/4 of the Southeast 1/4 thereof; AND The East 1/2 of Section 24, Township 18 South, Range 20 East, LESS that portion deeded to Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, Page 689, Public Records of Sumter County, Florida; AND That portion of the Northeast 1/4 of Section 25, Township 18 South, Range 20 East, LESS that portion deeded to Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, page 689, Public Records of Sumter County, Florida; AND Section 30, Township 18 South, Range 21 East, LESS that portion deeded to Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, page 689, Public Records of Sumter County, Florida; AND Section 29, Township 18 South, Range 21 East, LESS the East 1/2 of the Northwest 1/4 thereof, AND LESS that portion deeded to Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, page 689, Public Records of Sumter County, Florida; AND The North 1/2 of Section 32, Township 18 South, Range 21 East, LESS those portions deeded to Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, page 689, Public Records of Sumter County, Florida AND The East 1/2 of the Southeast 1/4 of Section 32, Township 18 South, Range 21 East, AND The East 1/2 of the Northeast 1/4 of Section 5, Township 19 South, Range 21 East, AND A portion of the Northwest 1/4 of Section 4, Township 19 South, Range 21 East. All of the above being located in Sumter County, Florida, and further described as follows: Commence at the Northwest corner of Section 4, Township 19 South, Range 21 East, Sumter County, Florida for a Point of Beginning; thence run South 01 degrees 31'10" West, along the West boundary of said Section 4, 459.97 feet; thence run North 16 degrees 29'22" West, 207.60 feet; thence run North 33 degrees 42'30" West, 314.36 feet to the North boundary of Section 5, Township 19 South, Range 21 East; thence run North 89 degrees 49'19" West, along said North boundary, 72.31 feet; thence run South 33 degrees 42'30" East, 345.66 feet; thence run South 16 degrees 29'22" East, 383.027 feet; thence run North 01 degrees 31'10" East, 58.82 feet; thence run South 25 degrees 36'18" East, 170.04 feet; thence run South 40 degrees 33'54" East, 799.24 feet; thence run South 26 degrees 34'18" East, 859.30 feet; thence run South 41 degrees 07'44" East, 312.18 feet; thence run South 24 degrees 47'10" East, 312.24 feet to the South boundary of said Section 4; thence run North 89 degrees 34'14" West, along said South boundary, 1367.94 feet to the West 1/4 corner of said Section 4; thence run North 89 degrees 44'18" West, 1326.26 feet; thence run North 01 degrees 41'55" East, 2631.63 feet to the Northwest corner of the East 1/2 of the Northeast 1/4 of Section 5; thence run North 00 degrees 17'46" East, 2630.28 feet to the boundary of the property conveyed to the Southwest Florida Water Management District by corrective warranty deed recorded in Official Records Book 386, page 689, Public Records of Sumter County, Florida; thence run along said boundary for the next 12 courses: North 00 degrees 23'05" East 251.90 feet; thence run North 89 degrees 37'13" West, 1450.09 feet; thence North 27 degrees 31'03" West, 2067.03 feet; thence North 76 degrees 22'12" West, 1378.81 feet; thence North 35 degrees 51'58" West, 4003.72 feet; thence North 78 degrees 25'35" West, 2516.30 feet; thence North 44 degrees 41'38" West 639.97 feet; thence North 82 degrees 09'11" West, 1463.85 feet; thence North 35 degrees 25'32" West 1861.34 feet; thence North 45 degrees 00'12" West 1230.25 feet; thence North 00 degrees 00'06" West, 4713.27 feet to the North boundary of Section 24, Township 18 South, Range 20 East; thence

run South 89 degrees 54'17" West, along said North boundary 430.88 feet; thence North 00 degrees 00'06" West, 1334.04 feet; thence North 89 degrees 42'19" East, 1650.82 feet; thence North 00 degrees 06'02" East, 4043.55 feet to the Northwest corner of the East 1/2 of the Northeast 1/4 of Section 13, Township 18 South, Range 20 East; thence run South 87 degrees 34'28" East along the North boundary of said Section 13, 1348.00 feet to the Southwest corner of Section 7, Township 18 South, Range 21 East; thence North 00 degrees 40'45" East along the West boundary of said Section 7, 3973.87 feet; thence South 89 degrees 46'30" East, 5298.18 feet to a point on the East boundary of said Section 7; thence North 89 degrees 42'22" East, 5316.91 feet to the East boundary of Section 8, Township 18 South, Range 21 East; thence South 00 degrees 24'22" East, along said East boundary 4006.02 feet to the Northeast corner of Section 17, Township 18 South, Range 21 East; thence run South 00 degrees 21'36" West along the East boundary of said Section 17, 2665.41 feet to the East 1/4 corner of said Section 17; thence North 89 degrees 41'10" West, 1324.80 feet; thence North 00 degrees 15'22" East 2664.54 feet to the North boundary of said Section 17; thence run North 89 degrees 43'24" West, along said North boundary, 3988.89 feet to the Northwest corner of said Section 17; thence South 00 degrees 03'00" West along the West boundary of said Section 17, 5323.97 feet to the Southwest corner of said Section 17; thence run South 89 degrees 25'40" East, along the South boundary of said Section 17, 2650.04 feet to the South 1/4 corner of said Section 17; thence South 00 degrees 01'22" West, 2641.28 feet; thence North 89 degrees 31'56" West 2659.22 feet to the West 1/4 corner of Section 20, Township 18 South, Range 21 East; thence run South 00 degrees 13'58" West along the West boundary of said Section 20, 1325.72 feet; thence South 89 degrees 41'26" West, 1342.87 feet; thence run South 00 degrees 29'16" West, 1326.36 feet to the South boundary of Section 19, Township 18 South, Range 21 East; thence North 89 degrees 39'59" East, along said South boundary, 1348.78 feet to the Southwest corner of Section 20, Township 18 South, Range 21 East; thence South 89 degrees 39'18" East, along said South boundary, 1334.75 feet; thence South 00 degrees 10'21" East, 2654.15 feet; thence South 89 degrees 42'18" East, 1335.27 feet; thence North 00 degrees 11'02" West, 2652.99 feet to said South boundary of Section 20; thence North 89 degrees 39'18" West along said South boundary, 1334.75 feet; thence North 00 degrees 07'17" East, 1324.31 feet; thence South 89 degrees 35'38" East, 3994.49 feet to the East boundary of said Section 20; thence run South 00 degrees 18'12" East along said East boundary, 1320.11 feet to the Northeast corner of Section 29, Township 18 South, Range 21 East; thence South 00 degrees 03'13" East, along the East boundary of said Section 29, 5301.20 feet to the Northeast corner of Section 32, Township 18 South, Range 21 East; thence South 00 degrees 13'16" West, along the East boundary of said Section 32, 5279.55 feet to the Point of Beginning.

RNR

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SCHEDULE B

1. Easement for Ingress and Egress to Southwest Florida Water Management District, recorded in Official Record book 336, page 604, Public Records of Sumter County, Florida.

2. Easement reserved by Sumter Electric Cooperative, Inc., in that Quit Claim Deed, dated August 14, 1989, from Sumter Electric Cooperative, Inc. to ALBERT CARLTON and wife, BARBARA C. CARLTON recorded on even date herewith.

3. Easement Agreement to Drake Ranch, recorded in Official Record Book 389, page 134, Public Records of Sumter County, Florida.

4. Those certain oil, mineral rights held by M.B. RUDMAN as set forth in conveyance, assignment and deed recorded in Official Records Book 259, page 112, Public Records of Sumter County, Florida and held by JAMES E. ALLISON as set forth in mineral rights and royalty transfer set forth in Deed Book 121, page 328A, Public Records of Sumter County, Florida. There is no record of any subsequent conveyance of those outstanding oil, gas and mineral rights by M.B. RUDMAN and JAMES G. ALLISON, however, a notice of subsurface interest was recorded in Official Records Book 169, page 133, Public Records of Sumter County, Florida, as to the interest held by M.B. RUDMAN. No notice pursuant to Sections 704.05, 712.05 and 712.06, Florida Statutes, has been filed in the Public Records of Sumter County, Florida in contection with oil, gas, mineral rights held by JAMES G. ALLISON.

APPENDIX II

SWFWMD lease agreement

SWF Parcel No. 19-193-102X
Approved by Attorney:

HALF-MOON/CARLTON
WILDLIFE MANAGEMENT AREA AGREEMENT

This Agreement, made and entered into this 28th day of May, 1992, by and between the Southwest Florida Water Management District, a public corporation created by Chapter 61-691, Laws of Florida, as amended, whose address is 2379 Broad Street, Brooksville, Florida 34609-6899, hereinafter referred to as "the District", and the Florida Game and Fresh Water Fish Commission, an agency existing under Article IV, Section 9, Florida Constitution, whose address is Farris Bryant Building, 620 South Meridian Street, Tallahassee, Florida 32301, hereinafter referred to as "the Commission".

1. TERM: This agreement shall be for a period of one (1) year, commencing on May 28, 1992, to and including May 27, 1993, and renewed automatically for each year thereafter, subject to suspension or termination under paragraph 22.

2. ACREAGE: The lands subject to this agreement, generally known as the Carlton Tract, contain approximately 4,021 acres as described in Exhibit "A" attached hereto and incorporated herein by reference, hereinafter referred to as "the Wildlife Management Area".

3. PURPOSE AND USES: The purpose of this agreement is to provide for management of the Carlton Tract as a Type I Wildlife Management Area, as defined in Exhibit "B" and to provide public hunting and fishing by the Commission, at a reasonable cost to the public, on lands owned by the District which are defined in Exhibit "A", and are subject to the following terms, conditions and limitations. The Wildlife Management Area shall be maintained principally for water management, water supply and the conservation, restoration and protection of water resources and natural ecological systems, and the wildlife management area uses, as herein provided, shall be subordinate to and not inconsistent therewith. The uses of the Wildlife Management Area authorized hereby shall be only for the management of wildlife and freshwater fish by all legal means, including the establishment and implementation of programs for hunting and for non-consumptive uses of game and non-game wildlife resources by the public. The Wildlife Management Area is subject to flooding; however, the District shall make reasonable efforts to inform the Commission of any anticipated natural water conditions or water conditions caused by the District's operations which may have a material effect on the uses authorized hereby. The District reserves the right to permit any form of lawful activities including recreation other than hunting in the Wildlife Management Area. The District shall administer such recreation and shall make reasonable efforts to ensure that such recreation does not conflict with the Commission's programs in the Wildlife Management Area.

4. SUBMISSION OF PROPOSALS: The Commission shall submit to the District's Executive Director on or before September 1, beginning in 1992, and every two (2) years thereafter, proposed rules for the Wildlife Management Area, including but not limited to hunting dates (see Exhibit "C"). The District's Executive Director shall review and approve or disapprove such proposed rules within sixty (60) days after submission by the Commission to the District. In

the event of disapproval of any such proposed rules, the District's Executive Director shall provide alternative proposed rules to the Commission. In addition, the Commission shall submit annually,on or before March 1, beginning in 1992, a map to the District proposing the uses in the Wildlife Management Area. Review and approval or disapproval of such map shall be within (60) days after submission to the District's Executive Director. The District's staff shall provide to the Commission alternate map changes in the event of disapproval. Annual amendments to the rules shall not be precluded if the proposed rule changes: (1) address significant threats to the long-term welfare of the fish and wildlife resources or their habitat; (2) address significant concerns of a Type I Wildlife Management Area landowner; (3) protect private property or public safety; (4) comply with constitutional or legislative changes in the Commission's authority; or, (5) avoid jeopardizing the effectiveness of existing or development of new Commission programs or management efforts.

5. LAW ENFORCEMENT: The Commission, to the fullest extent of its authority and within the constraints of budget and manpower, shall enforce the law in the Wildlife Management Area, including but not limited to patrolling; protecting against vandalism, fires, litter, habitat destruction, unauthorized use; and enforcing all federal and state laws and rules relating to the management, protection and taking of wild animal life and freshwater aquatic life.

6. REPORTS: The Commission shall submit a post-hunt report to the District no later than thirty (30) days after the closing date of any hunting season established in the Wildlife Management Area, including a harvest report by species, the number of users, and the number and description of the citations issued and arrests made by the Commission within the Wildlife Management Area. The Commission also shall provide to the District a copy of all reports and studies it makes or prepares concerning the Wildlife Management Area. Proposed annual work plans, and annual work accomplishment reports concerning the development and maintenance of ongoing Commission programs shall be submitted to the District in a timely fashion.

7. COSTS AND MAINTENANCE: Repairs to and maintenance of bridges, fences, roads and other improvements in the Wildlife Management Area shall be the sole responsibility of the District. The Commission shall be responsible for all costs directly attributed to the maintenance and/or replacement of any structure(s) or sign(s) erected by the Commission.

8. HABITAT, BIOLOGICAL SURVEYS AND MONITORING SITES: The Commission may plan and implement programs for wildlife habitat improvements in the Wildlife Management Area with prior written approval of the District. However, the Commission shall not unreasonably interfere with or degrade the quality of habitat or waters in the Wildlife Management Area, and the Commission, to the best of its ability and to the fullest extent of its authority, shall prevent such interference or degradation by any person. The Commission may conduct biological surveys or assessments in the Wildlife Management Area. However, no such surveys or assessments requiring or resulting in material physical alteration to the existing habitat shall be made without the prior written approval of the District. The District may maintain monitoring sites for environmental studies. The District shall notify the Commission of any plans for

such monitoring sites and of the location of such monitoring sites, and the Commission shall not do anything whereby such sites are disturbed or degraded.

9. ENDANGERED SPECIES: Nest sites known to be inhabited by bald eagles shall be posted as "RESTRICTED" by the Commission for the protection of that species and no public access shall be allowed.

10. STRUCTURES: The Commission shall obtain the prior written approval of the District before constructing or locating any structure in the Wildlife Management Area. No structure shall be constructed or located permanently. The Commission shall maintain all such structures. The Commission shall remove all structures which it has constructed or located in the Wildlife Management Area upon termination of this agreement as provided in paragraph 20. The Commission shall not install, or permit to be installed, pit or vault latrines. Any other sanitary facility, except portable toilets installed by the Commission at designated check stations, shall be prohibited.

11. SIGNS: The Commission, at its expense, shall post the public entrance to the Wildlife Management Area with the sign bearing the legend set out in Exhibit "D" attached hereto and incorporated herein by reference and shall post at reasonable places along the boundaries of the Wildlife Management Area signs bearing the legend set out in Exhibit "E" attached hereto and incorporated herein by reference.

12. MAINTENANCE AND PRESERVATION: Except as provided in paragraph 7, the Commission, shall maintain and preserve the Wildlife Management Area in a clean and natural state and shall prevent and remove all litter and debris on the Wildlife Management Area arising from the uses authorized hereby. Further, except as priorly approved in writing by the District under paragraph 8, the Commission, to the best of its ability, shall prevent the removing or cutting of live or dead trees or plants and the starting of fires by any person.

13. USE OF MOTOR VEHICLES: The use of private vehicles will be allowed on select all-weather roads, as determined by the District. Wet-weather barriers and/or "road closed" signs will be installed by the Commission on roads mutually determined by the District and the Commission, to be unsuitable for public use. Vehicular and hunter access will be controlled by the Commission at the check station located on the adjacent Half-Moon Wildlife Management Area.

14. PARKING AREAS: Parking areas will be designated at various locations, as shown in Exhibit "F", to prevent undue disturbance to existing roadways, road shoulders and adjacent habitat.

15. USE OF ADJACENT LANDS OWNED BY THE STATE OF FLORIDA BOARD OF TRUSTEES: The Commission has management responsibility and control concerning adjacent land owned by the State of Florida Board of Trustees. There are established roadways lying on this adjacent land. To the extent that the Commission has the authority and controls the use of Board of Trustees' lands, the Commission will permit the District to use those roadways for ingress and egress onto District property. The location of these roadways is shown on Exhibit "F" which is attached hereto and incorporated herein by reference.

16. SITE INSPECTION AND ACCEPTANCE: The Commission accepts the lands described in Exhibit "A" in their present condition. Failure of the Commission to acquaint itself with the present appearance, conditions and boundaries of the Wildlife Management Area shall not relieve the Commission of performance hereunder. The District may enter and inspect the Wildlife Management Area at any time to ensure compliance by the Commission hereunder or for any purpose may enter the Wildlife Management Area.

17. ADDITIONAL USES: The District may lease or otherwise make use of any part or all of the Wildlife Management Area for any lawful purpose, including but not limited to apiary sites, cattle grazing, haying, hiking and nature study.

18. HORSEBACK RIDING: Horseback riding will be prohibited on that portion of the Wildlife Management Area owned by the District and will be posted as "closed" to such activity by the Commission.

19. INDEMNIFICATION: To the extent permitted by law, the Commission shall fully defend, indemnify and hold harmless the District from any actions, causes, claims, demands, losses, judgments, recoveries and suits made against the District arising from the uses of the Wildlife Management Area authorized hereby. Nothing contained herein shall be construed as a waiver of immunity of the parties hereto under federal or state law. Nothing contained herein shall be construed as a waiver of the limitations on liability enjoyed by a landowner providing lands to the public for outdoor recreational purposes, as provided in Section 375.251, Florida Statutes.

20. DISCRIMINATION: The Commission shall comply with the Civil Rights Act of 1964, as amended, and shall not exclude any person from participating in, deny to any person the benefits of, or otherwise subject to discrimination any person utilizing the Wildlife Management Area and any Commission operation thereon, due to race, religion, color, creed, sex, or national origin.

21. FEES AND PROFITS: Except for fees established by law, the Commission shall not charge the public for uses of the Wildlife Management Area, and the uses of the Wildlife Management Area authorized hereby shall not be for profit.

22. SUSPENSION OR TERMINATION: The District may suspend this agreement or hunting conducted hereunder immediately and temporarily until the cause for suspension is completed, dissipates, or is rectified, as to all or any part of the Wildlife Management Area by giving written notice to the Commission in the event that suspension is necessary because:

a. Conditions exist that are dangerous to the safety of life or property from fire, flood, or other such causes;

b. The Wildlife Management Area is required for a District flood control or water management conservation project such that use of the lands for wildlife management or for hunting conducted under this agreement is impractical or impossible;

c. There has been a breach of the terms and conditions of this agreement by the Commission;

d. The Wildlife Management Area is required by the District for construction or any other activity; or,

e. Conditions exist that would damage the environmental or physical characteristics, or impair the function of habitat, water management, water supply, or conservation and protection of water resources within the Wildlife Management Area.

The District may immediately terminate this agreement by giving written notice to the Commission as provided in paragraph 23 in the event suspension is not adequate to address those conditions enumerated in this paragraph and terminated in lieu of suspension is required. In the event of imminent threat to the public health, safety, or welfare, the District may immediately suspend this agreement until such imminent threat no longer exists without such written notice as provided in paragraph 23. However, in the event of such imminent threat, the District shall give such notice to the Commission's regional office in Ocala, Florida, or to the Commission's headquarters in Tallahassee, Florida, as is practicable under the circumstances. In the event of such imminent threat, the District may immediately close the Wildlife Management Area to public access and, upon receiving such actual notice of such immediate suspension and closure, the Commission shall take immediate steps to assist the District in enforcing such closure.

Either party shall have the right to terminate this agreement upon ninety (90) days written notice to the other party; provided, however, that if said notice of termination is given after February 1 of any calendar year, the date of termination shall be the first January 15 after the date of said notice or ninety (90) days after the date of said notice, whichever shall be later. In the event of termination, the Commission shall remove expeditiously all structures constructed or located pursuant to paragraph 10 and all signs erected pursuant to paragraph 11. In the event of suspension or termination, the Commission shall assist the District in removal of all persons admitted to the Wildlife Management Area.

23. ADMINISTRATION; NOTICES: This agreement shall be administered for the District and the Commission by their respective executive directors.

All notices to the District shall be in writing and hand-delivered or sent by certified United States mail, return receipt requested, to the Executive Director and/or the Land Resources Director, at 2379 Broad Street, Brooksville, Florida 34609-6899. All notices to the Commission shall be in writing and hand-delivered or sent by certified United States mail, return receipt requested, to the Executive Director at the Farris Bryant Building, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

24. COMPLETE AGREEMENT: This agreement contains the complete understanding between the District and the Commission and shall supersede all other agreements between the District and the Commission as to the Wildlife Management Area.

25. MODIFICATION OF AGREEMENT: No waiver or modification of this agreement or of any covenant, condition, or limitation herein contained shall be

valid unless in writing and lawfully executed by the party to be charged therewith.

26. NON-ASSIGNMENT: Any assignments or delegation of the Commission's covenants or duties hereunder, other than to employees of the Commission or agents of the Commission in the usual course of the Commission's business, shall be without any binding effect on either party and shall be null and void.

In Witness Whereof, the lawful representatives of the parties hereto have executed this agreement on the day and year above first written.

Attest:

Sally Thompson, Secretary

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

By: Charles A. Black, Chairman

(Seal)

Attest:

FLORIDA GAME AND FRESH WATER FISH COMMISSION

Attest: Colonel Robert M. Brantly, Executive Director

(Seal)

APPROVED AS FISCALLY AND BUDGETARILLY SOUND

William C. Sumner

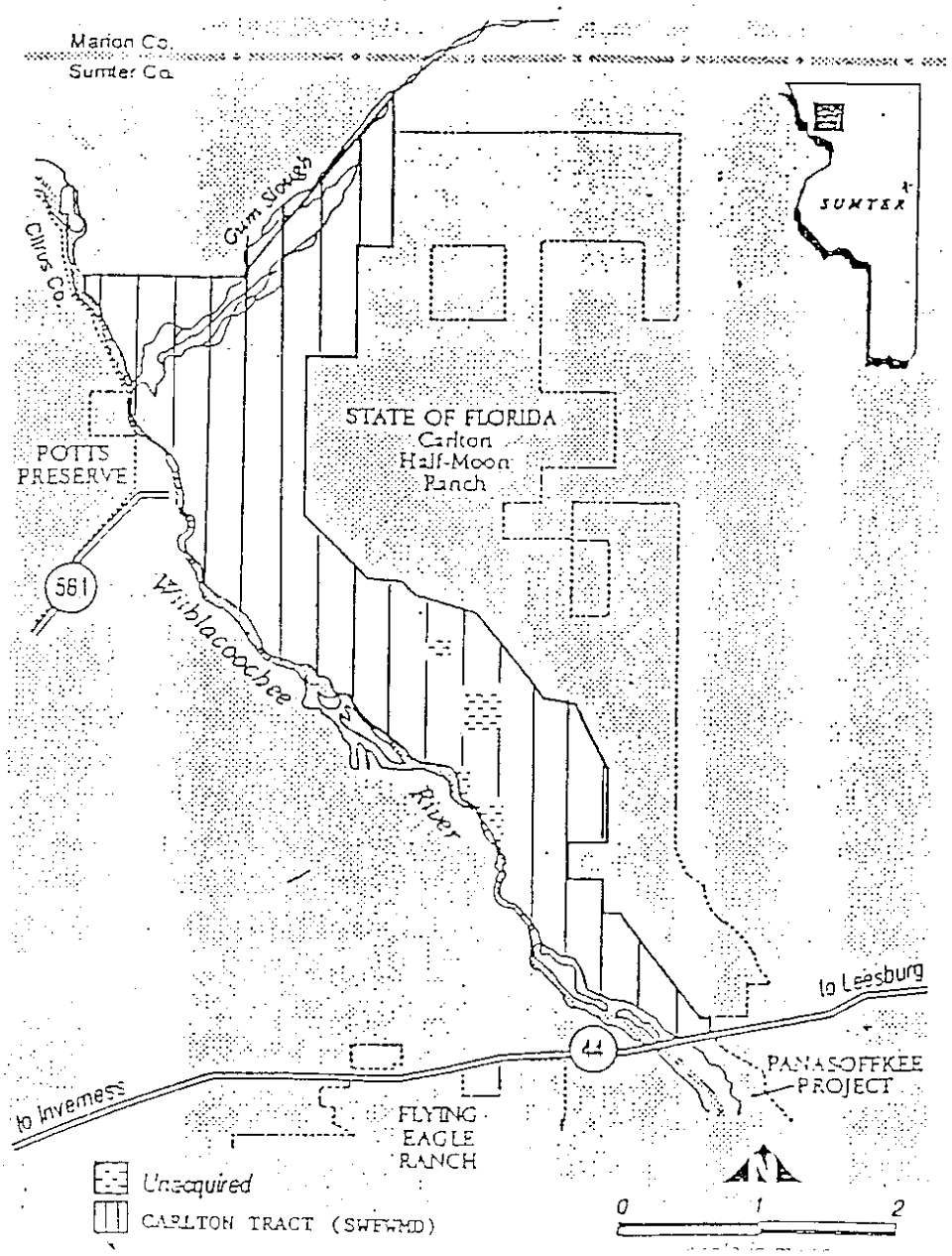
DIRECTOR
DIVISION OF ADMINISTRATIVE SERVICES
GFWFC

APPROVED AS TO FORM AND LEGAL SUFFICIENCY

Commission Attorney

CARL.WMA
03/12/92

EXHIBIT A


Marion Co.
Sumter Co.
Citrus Co.
Gum Sloughs
SUMTER
STATE OF FLORIDA
Carlton
Half-Moon
Ranch
POTTS
PRESERVE
561
Withlacoochee
River
to Leesburg
to Inverness
FLYING
EAGLE
RANCH
PANASOFFKEE
PROJECT
Unacquired
CARLTON TRACT (SWFWMD)
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1
2

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
Withlacoochee River Basin
Wildlife Management Area

Parcel No. 19-193-102X August 19, 1991

Commence at the NW corner of SECTION 9, TOWNSHIP 19 SOUTH, RANGE 21 EAST;

Run thence S 02° 06' 18" W (grid bearing) along the West line of said Section 9, a distance of 2090.06 feet to the North right-of-way line of State Road 44, said point being the POINT OF BEGINNING;

Thence N 79° 57' 38" E along said right-of-way line a distance of 1171.03 feet to the West line of the East 200 feet of the West 1/2 of the NW 1/4 of said Section 9;

Thence N 01° 37' 21" E along said West line a distance of 682.98 feet;

Thence N 41° 30' 58" W a distance of 5166.88 feet to the North line of the SE 1/4 of SECTION 5, TOWNSHIP 19 SOUTH, RANGE 21 EAST;

Thence N 89° 59' 54" W along said North line a distance of 249.14 feet to the SE corner of the SE 1/4 of the NW 1/4 of said Section 5;

Thence N 00° 41' 17" E along the East line of said SE 1/4 of the NW 1/4 a distance of 1326.72 feet to the NE corner of said SE 1/4 of the NW 1/4;

Thence S 89° 48' 15" W along the North line of said SE 1/4 of the NW 1/4 a distance of 1322.46 feet to the SE corner of the NW 1/4 of the NW 1/4 of said Section 5;

Thence N 00° 04' 28" E along the East line of said NW 1/4 of the NW 1/4 a distance of 1323.88 feet to the SW corner of the SE 1/4 of the SW 1/4 of SECTION 32, TOWNSHIP 18 SOUTH, RANGE 21 EAST;

Thence N 89° 52' 35" E along the South line of said SE 1/4 of the SW 1/4 a distance of 1321.81 feet to the SE corner of the SW 1/4 of said Section 32;

Thence N 00° 21' 07" E along the East line of said SW 1/4 a distance of 2635.02 feet to the NE corner of said SW 1/4;

Thence N 27° 29' 27" W, a distance of 2351.79 feet;

Thence N 76° 22' 01" W, a distance of 1378.85 feet;

Thence N 35° 51' 14" W, a distance of 4003.63 feet;

Thence N 78° 25' 20" W a distance of 2516.20 feet;

Thence N 44° 41' 00" W, a distance of 639.94 feet;

Thence N 82° 08' 48" W, a distance of 1463.73 feet;

Thence N 35° 24' 44" W, a distance of 1061.34 feet;

Thence N 45° 00' 00" W, a distance of 1230.31 feet;

Thence North, a distance of 4713.19 feet to the North line of Section 24, Township 18 South, Range 20 East;

Thence N 89° 42' 54" W, along said North line a distance of 430.04 feet;

Thence North, a distance of 1334.10 feet;

Thence N 88° 27' 14" W a distance of 2374.52 feet to the NE corner of the S 1/2 of the SE 1/4 of SECTION 14, TOWNSHIP 18 SOUTH, RANGE 20 EAST;

Thence S 89° 37' 24" W along the North line of said S 1/2 of the SE 1/4 a distance of 2633.44 feet to the NW corner of said S 1/2 of the SE 1/4;

Thence S 00° 03' 51" W along the West line of said S 1/2 of the SE 1/4 a distance of 1350.11 feet to the NE corner of the NW 1/4 of SECTION 23, TOWNSHIP 18 SOUTH, RANGE 20 EAST;

Thence N 89° 35' 17" W along the North line of said NW 1/4 to the thread of the Withlacoochee River;

Thence Southerly and Southeasterly along the thread of the Withlacoochee River to the Northerly right-of-way line of State Road 44;

Thence N 79° 57' 38" E along said North right-of-way line to the POINT OF BEGINNING;

EXCEPT

Any portion of the following that lies easterly of the thread of the Withlacoochee River;

The Northwest 1/4 of the Northwest 1/4 of SECTION 23, TOWNSHIP 18 SOUTH, RANGE 20 EAST;

The Southeast 1/4 of the Northeast 1/4 of SECTION 36, TOWNSHIP 18 SOUTH, RANGE 20 EAST;

The Southwest 1/4 of SECTION 31, TOWNSHIP 18 SOUTH, RANGE 21 EAST;

The Southwest 1/4 of the Southeast 1/4 of SECTION 31, TOWNSHIP 18 SOUTH, RANGE 21 EAST;

The West 1/2 of the Northeast 1/4 of SECTION 6, TOWNSHIP 19 SOUTH, RANGE 21 EAST;

The Southeast 1/4 of the Southeast 1/4 of SECTION 6, TOWNSHIP 19 SOUTH, RANGE 21 EAST;

AND EXCEPT

All of the Southwest 1/4 of the Northeast 1/4 of the Southwest 1/4 of SECTION 30, TOWNSHIP 18 SOUTH, RANGE 21 EAST;

AND EXCEPT

That portion of the Northwest 1/4 of the Northeast 1/4 of SECTION 31, TOWNSHIP 18 SOUTH, RANGE 21 EAST not lying within the West 2-1/2 chains of the North 20 chains.

Parcel contains 3048.5 acres, more or less, including approximately 87.5 acres of submerged lands below the ordinary high water line of the Withlacoochee River.

AND ALSO

That part of SECTIONS 1, 12, 13, 14 and 15, TOWNSHIP 18 SOUTH, RANGE 20 EAST, Sumter County, Florida, described as follows:

Commence at the NE corner of said Section 13, said point being the POINT OF BEGINNING;

Run thence N87°15'05"W along the North line of the NE 1/4 of said Section 13 a distance of 1354.44 feet to the NE corner of the West 1/2 of the NE 1/4 of said Section 13;

Thence S00°20'50"W along the East line of said West 1/2 of the NE 1/4 a distance of 2685.82 feet to the SE corner thereof;

Thence S00°14'49"W along the East line of the NW 1/4 of the SE 1/4 of said Section 13 a distance of 1342.47 feet to the SE corner thereof;

Thence N89°05'28"W along the South line of said NW 1/4 of the SE 1/4 a distance of 1341.99 feet to the SE corner of the North 1/2 of the SW 1/4 of said Section 13;

Thence continue N89°05'26"W along said South line of the North 1/2 of the SW 1/4 a distance of 312.37 feet;

Thence South a distance of 26.40 feet;

Thence N88°27'14"W a distance of 2374.54 feet to the SE corner of the North 1/2 of the SE 1/4 of said Section 14;

Thence S89°37'24"W along the South line of said North 1/2 of the SE 1/4 a distance of 2633.44 feet to the SW corner thereof;

Thence S00°03'51"W along the East line of the SW 1/4 of said Section 14 a distance of 1350.11 feet to the SE corner thereof;

Thence N89°35'17"W along the South line of said SW 1/4 a distance of 1238.81 feet more or less to the thread of the Withlacoochee River;

Thence Northwesterly along the thread of the Withlacoochee River to a point on the West line of the NW 1/4 of said Section 14;

Thence N00°16'22"E along said West line of the NW 1/4 a distance of 200.00 feet more or less to a point on the NE bank of the Withlacoochee River;

Thence Northwesterly along said NE bank of the Withlacoochee River to a point in said Section 15 lying on a Westerly extention of the North line of the South 1/2 of the NW 1/4 of said Section 14;

Thence N88°02'16"E along said Westerly extention of the North line of the South 1/2 of the NW 1/4 a distance of 286.62 feet to the NW corner of the South 1/2 of the NW 1/4 of said Section 14;

Thence N88°02'16"E along the North line of said South 1/2 of the NW 1/4 a distance of 2625.69 feet to the NE corner thereof;

Thence continue N88°02'16"E along the North line of the South 1/2 of the NE 1/4 of said Section 14 a distance of 2624.16 feet;

Thence N40°10'33"E a distance of 8465.15 feet to a point on the East line of said Section 1;

Thence S00°32'37"W along said East line of Section 1 a distance of 27.90 feet to the NE corner of said Section 12;

Thence continue S00°32'37"W along the East line of said Section 12 a distance of 5313.68 feet to the SE corner thereof, said point being the POINT OF BEGINNING;

EXCEPT

Begin at the SW corner of the North 1/2 of the SW 1/4 of SECTION 13, TOWNSHIP 18 SOUTH, RANGE 20 EAST, Sumter County, Florida;

Thence S89°05'27"E, along the south line of said North 1/2 of the SW 1/4, a distance of 2373.97 feet;

Thence South, a distance of 26.40 feet;

Thence N88°27'14"W, a distance of 2374.54 feet to the POINT OF BEGINNING.

Parcel contains 972.81 acres, more or less, including approximately 22.66 acres of area lying within the Withlacoochee River and Gum Slough.

RAH:WRB:sw
19102X.WMA

EXHIBIT B

The Florida Game And Freshwater Fish Commission's 1991-1992 Hunting Handbook Regulations Summary defines a Type I Wildlife Management Area as:

> "Type I wildlife management areas are public hunting and recreation areas operated by the Commission in cooperation with private, state and federal landowners. A $25 Wildlife Management Area Stamp is required of all hunters (except those indicated as exempt on page 6 of this handbook) to hunt in these areas. Persons who possess a gun on a Type I wildlife management area for the exclusive purpose of shooting at a Commission-authorized shooting range are exempt from wildlife management area requirements. A Quota Hunt Permit may also be required during certain time periods. Type I wildlife management area stamps and wildlife management area regulations brochures, and most quota hunt application forms are available from county tax collectors and their subagents. Type I wildlife management area brochures and quota hunt application forms are also available from any of the Commission's five regional administrative offices, listed on page 2."

EXHIBIT "C"

HALF MOON WILDLIFE MANAGEMENT AREA

A. OPEN SEASON:

1. ARCHERY -- SEPTEMBER 26-28 AND OCTOBER 2-4.
2. MUZZLELOADING GUN -- OCTOBER 30 THROUGH NOVEMBER 1.
3. GENERAL GUN -- NOVEMBER 14-16 AND 20-22.
4. SMALL GAME -- DECEMBER 4-6, 11-13, AND 18-20.
5. SPRING TURKEY -- MARCH 26-28 AND APRIL 2-4 AND 9-11.
6. FISHING AND FROGGING -- PERMITTED THROUGHOUT THE YEAR.
7. TRAPPING AND FROGGING -- PROHIBITED.

B. LEGAL TO TAKE: ALL LEGAL GAME, FISH, AND FURBEARERS. DURING THE ARCHERY, MUZZLELOADING GUN, AND GENERAL GUN SEASONS, ANTLERLESS DEER MAY BE TAKEN BY PERMIT ONLY. DURING THE ARCHERY, MUZZLELOADING GUN, AND GENERAL GUN SEASONS THE BAG LIMIT FOR ANTLERED DEER SHALL BE ONE (1) PER QUOTA HUNT PERMIT. DURING THE SPRING TURKEY SEASON, THE BAG LIMIT FOR TURKEY SHALL BE ONE (1) GOBBLER (OR BEARDED TURKEY) PER QUOTA HUNT PERMIT.

C. CAMPING -- PROHIBITED.

D. GENERAL REGULATIONS:

1. DURING PERIODS WHEN THE AREA IS CLOSED TO HUNTING, PUBLIC ACCESS OTHER THAN ON FOOT (PEDESTRIAN) OR HORSEBACK (EQUESTRIAN) IS PROHIBITED.
2. PUBLIC ACCESS IS PROHIBITED IN AREAS POSTED AS "RESTRICTED" FOR THE PROTECTION OF ENDANGERED SPECIES.
3. HUNTING WITH DOGS IS PROHIBITED, EXCEPT BIRD DOGS MAY BE USED DURING THE SMALL GAME SEASON AND DOGS ON LEASH MAY BE USED FOR TRAILING WOUNDED GAME.
4. VEHICLES MAY BE OPERATED ONLY ON NAMED OR NUMBERED ROADS AND MAY BE PARKED ONLY AT DESIGNATED PARKING AREAS.
5. THE USE OF TRACKED VEHICLES, AIRBOATS, MOTORCYCLES, OR ALL-TERRAIN VEHICLES IS PROHIBITED. THE USE OF HORSES IS PROHIBITED DURING THE ARCHERY, MUZZLELOADING GUN, GENERAL GUN, AND SPRING TURKEY SEASONS.
6. HUNTERS SHALL CHECK IN AND OUT AT THE CHECK STATION WHEN ENTERING OR EXITING THE AREA AND SHALL CHECK ALL GAME TAKEN.
7. NO DEER, HOG, OR TURKEY SHALL BE DISMEMBERED UNTIL CHECKED AT THE CHECK STATION.
8. A QUOTA HUNT PERMIT SHALL BE REQUIRED FOR EVERY HUNTER ENTERING THE AREA.

NOTE: OTHER GENERAL REGULATIONS RELATING TO TYPE 1 WILDLIFE MANAGEMENT AREAS MIGHT APPLY.

EXHIBIT "C" (CONTINUED)

GENERAL REGULATIONS RELATING TO TYPE 1 WILDLIFE MANAGEMENT AREAS

1. GENERAL PROHIBITIONS: HUNTING, FISHING, OR TRAPPING IS PROHIBITED ON ANY PORTION OF ANY WILDLIFE MANAGEMENT AREA POSED AS CLOSED TO HUNTING, FISHING, OR TRAPPING. HUNTING, FISHING, TRAPPING, CAMPING, OR OTHER USAGE RELATED TO SUCH ACTIVITY ON ANY WILDLIFE MANAGEMENT AREA SHALL ONLY BE AT THE TIME AND IN THE MANNER PROVIDED BY THE REGULATIONS FOR THE PARTICULAR WILDLIFE MANAGEMENT AREA. ALL LEGAL METHODS FOR TAKING FISH OR WILDLIFE WILL BE PERMITTED, UNLESS PROHIBITED UNDER THE RULES GOVERNING A PARTICULAR AREA.

2. PERMITS REQUIRED:

   A. A WILDLIFE MANAGEMENT AREA STAMP AS PROVIDED BY S.372.57, FLORIDA STATUTES, IN ADDITION TO ALL REGULAR LICENSE REQUIREMENTS, IS REQUIRED FOR PERSONS, EXCEPT THOSE EXEMPTED IN SUBSECTION (3) HEREOF, TO HUNT, TRAP OR BE IN POSSESSION OF A GUN, TRAP, OR OTHER DEVICE FOR TAKING WILDLIFE OR FURBEARING ANIMALS ON A WILDLIFE MANAGEMENT AREA.

   B. A SPECIAL DAILY OR SEASONAL WILDLIFE MANAGEMENT AREA STAMP IS MANDATORY ON THOSE WILDLIFE MANAGEMENT AREAS WHERE REQUIRED BY REGULATIONS FOR THAT AREA.

   C. A WILDLIFE MANAGEMENT AREA STAMP SHALL BE REQUIRED OF ANY PERSON, EXCEPT THOSE EXEMPTED IN SUBSECTION (3) HEREOF, WHO ENGAGES IN ANY OUTDOOR RECREATION ACTIVITY ON THE J. W. CORBETT AND CECIL M. WEBB AREAS (EXCEPT FOR ORGANIZED GROUP ACTIVITY UNDER CONTRACTUAL AGREEMENT WITH THE COMMISSION). MEMBERS OF A STAMPHOLDER'S FAMILY (INCLUDES SPOUSE AND DEPENDENT CHILDREN) TRAVELING IN THE COMPANY OF A STAMPHOLDER ARE EXEMPT FROM THESE RECREATIONAL STAMP REQUIREMENTS.

3. PERMIT EXCEPTIONS: PERSONS EXEMPTED BY S. 372.57(1) OR (6), OR THOSE PERSONS WHO POSSESS A GUN ON A WILDLIFE MANAGEMENT AREA FOR THE EXCLUSIVE PURPOSE OF SHOOTING AT A COMMISSION-AUTHORIZED SHOOTING RANGE ARE EXEMPT FROM WILDLIFE MANAGEMENT AREA STAMP REQUIREMENTS.

4. LEGAL TO HUNT:

   A. ONLY GOBBLERS OR BEARDED TURKEYS MAY BE TAKEN DURING THE SPRING SEASON; TURKEYS MAY NOT BE TAKEN DURING ANY FALL SEASON IN WHICH FIREARMS MAY BE USED UNLESS OTHERWISE PROVIDED FOR A SPECIFIC AREA.

SEASON OPEN ONLY FOR THE TAKING OF FURBEARING ANIMALS OR FROGS UNLESS OTHERWISE STIPULATED IN A REGULATION ESTABLISHED FOR A SPECIFIC AREA.

C. NO PERSON SHALL HAVE ANY GUN UNDER HIS CONTROL WHILE UNDER THE INFLUENCE OF ALCOHOL OR DRUGS.

D. THE POSSESSION OF CENTER-FIRE RIFLES IS PROHIBITED DURING SMALL GAME SEASON.

E. THE POSSESSION OF ANY FIREARM CONTAINING SHELLS OR CARTRIDGES, OR ANY CAPPED OR PRIMED MUZZLELOADING GUN IS PROHIBITED ON ANY PUBLIC CAMPSITE OR CHECK STATION AREA. THE DISCHARGE OF FIREARMS IS PROHIBITED ON, FROM, OR ACROSS ANY CAMPSITE OR CHECK STATION AREAS.

7. DOGS:

A. DOGS MAY BE USED FOR HUNTING DURING OPEN SEASONS UNLESS PROHIBITED BY REGULATIONS FOR THE PARTICULAR MANAGEMENT AREA.

B. NO PERSON SHALL KNOWINGLY OR NEGLIGENTLY ALLOW ANY DOG TO PURSUE OR MOLEST ANY WILDLIFE DURING ANY PERIOD IN WHICH THE TAKING OF SUCH WILDLIFE BY THE USE OF DOGS IS PROHIBITED.

C. NO PERSON SHALL POSSESS ANY DOG DURING ANY PERIOD IN WHICH THE TAKING OF WILDLIFE BY THE USE OF DOGS IS PROHIBITED PROVIDED THAT DOGS NOT NORMALLY USED FOR HUNTING AND KEPT UNDER RESTRAINT MAY BE POSSESSED.

8. CAMPING:

A. CAMPING DURING OPEN SEASON SHALL BE LIMITED TO DESIGNATED CAMPSITES EXCEPT UNDER SPECIAL RULES FOR PARTICULAR WILDLIFE MANAGEMENT AREAS. CAMPING IS PERMITTED DURING CLOSED SEASON UNLESS PROHIBITED BY SPECIFIC AREA REGULATIONS.

B. WHEN CAMPING IS PERMITTED ON ANY WILDLIFE MANAGEMENT AREA, AUTHORIZED CAMPING EQUIPMENT MAY BE TAKEN ON THE AREA AFTER 8:00 A.M. ONE (1) DAY BEFORE THE OPENING OF EACH SEASON AND SHALL BE REMOVED FROM THE AREA BEFORE 6:00 P.M. ONE (1) DAY FOLLOWING THE CLOSE OF EACH SEASON UNLESS OTHERWISE PROVIDED BY SPECIFIC AREA REGULATIONS.

9. VEHICLES:

A. NO MOTOR VEHICLE SHALL BE OPERATED ON ANY PART OF ANY WILDLIFE MANAGEMENT AREA DESIGNATED BY AREA REGULATIONS AS CLOSED TO VEHICULAR TRAFFIC OR TEMPORARILY CLOSED BY ADMINISTRATIVE ACTION AND POSTING NOTICE OF SUCH ON THOSE AREAS BECAUSE OF INCLEMENT WEATHER, POOR ROAD CONDI-

TIONS, CONSTRUCTION OR MANAGEMENT ACTIVITIES, OR WILDLIFE SURVEYS. THE USE OF TWO-WHEELED MOTOR-POWERED VEHICLES OR ALL-TERRAIN VEHICLES IS PROHIBITED ON ANY ROADS OR TRAILS NOT OPEN TO OR USED BY OTHER VEHICLES UNLESS OTHERWISE PROVIDED BY SPECIFIC AREA REGULATION.

B. NO PERSON SHALL PARK ANY VEHICLE IN A MANNER WHICH OBSTRUCTS A ROAD, GATE, OR FIRELANE.

10. GRAIN AND FOOD: NO PERSON SHALL PLACE, EXPOSE, OR DISTRIBUTE ANY GRAIN OR OTHER FOOD FOR WILDLIFE ON ANY WILDLIFE MANAGEMENT AREA EXCEPT AS AUTHORIZED BY PERMIT FROM THE EXECUTIVE DIRECTOR. NO PERSON SHALL TAKE WILDLIFE ON ANY LAND OR WATERS UPON WHICH GRAIN OR OTHER FOOD HAS BEEN DEPOSITED, PROVIDED THAT QUAIL MAY BE HUNTED IN PROXIMITY TO ESTABLISHED GAME FEEDERS.

11. RELEASE OF WILDLIFE: NO PERSON SHALL RELEASE WILDLIFE OF ANY SPECIES ON ANY WILDLIFE MANAGEMENT AREA UNLESS AUTHORIZED BY PERMIT FROM THE EXECUTIVE DIRECTOR.

12. PLANTS: NO PERSON SHALL CUT OR DESTROY ANY TREE ON, OR REMOVE ANY TREE, SHRUB, OR PROTECTED PLANT (AS DESIGNATED IN S. 581.185, FLORIDA STATUTES) FROM, ANY WILDLIFE MANAGEMENT AREA WITHOUT WRITTEN PERMISSION FROM THE LANDOWNER OR PRIMARY LAND MANAGER.

13. NOTWITHSTANDING ANY OTHER PROVISIONS HEREIN, THE HARVEST OF ALLIGATORS, THEIR EGGS OR HATCHLINGS MAY BE CONDUCTED ON TYPE I WILDLIFE MANAGEMENT AREAS IN ACCORDANCE WITH COMMISSION ORDER(S) AND RULES 39-25.031, 39-25.032, AND 39-25.042. A PRIVATE LANDOWNER MAKING HIS LANDS AVAILABLE FOR USE IN THE TYPE WILDLIFE MANAGEMENT AREA SYSTEM MAY PARTICIPATE IN AN ALLIGATOR MANAGEMENT PROGRAM ON SUCH LANDS IN ACCORDANCE WITH RULE 39-25.032.

PME:bh
EXHIBIT.C
January 23, 1992

HALF-MOON WILDLIFE MANAGEMENT AREA

A FEDERAL AID PROJECT

UNAUTHORIZED GUNS, DOGS, OR TRAPPING

NOT ALLOWED

FLORIDA GAME AND FRESHWATER FISH COMMISSION,

FLORIDA DEPARTMENT OF NATURAL RESOURCES

AND

THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

COOPERATING

EXHIBIT "D"

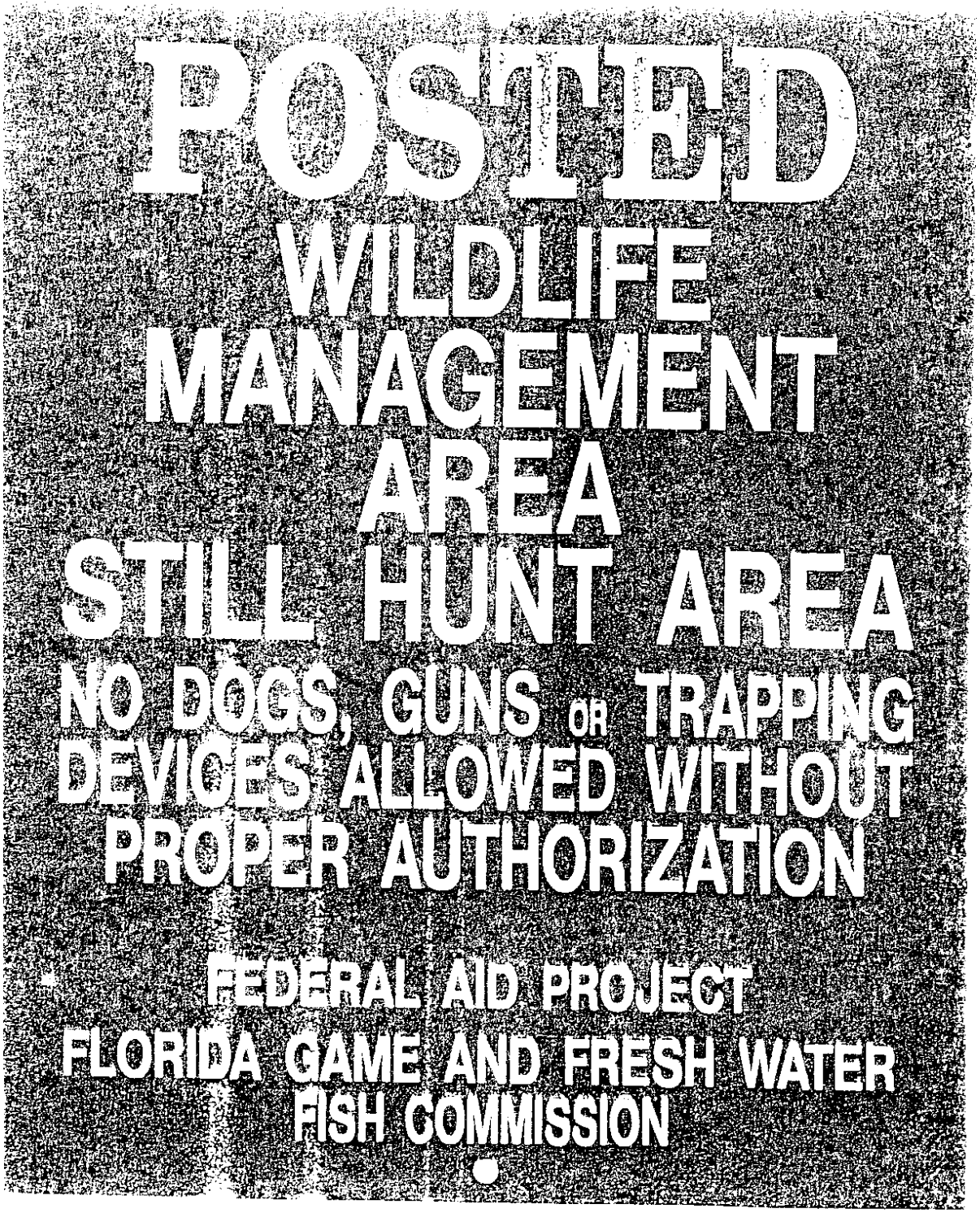
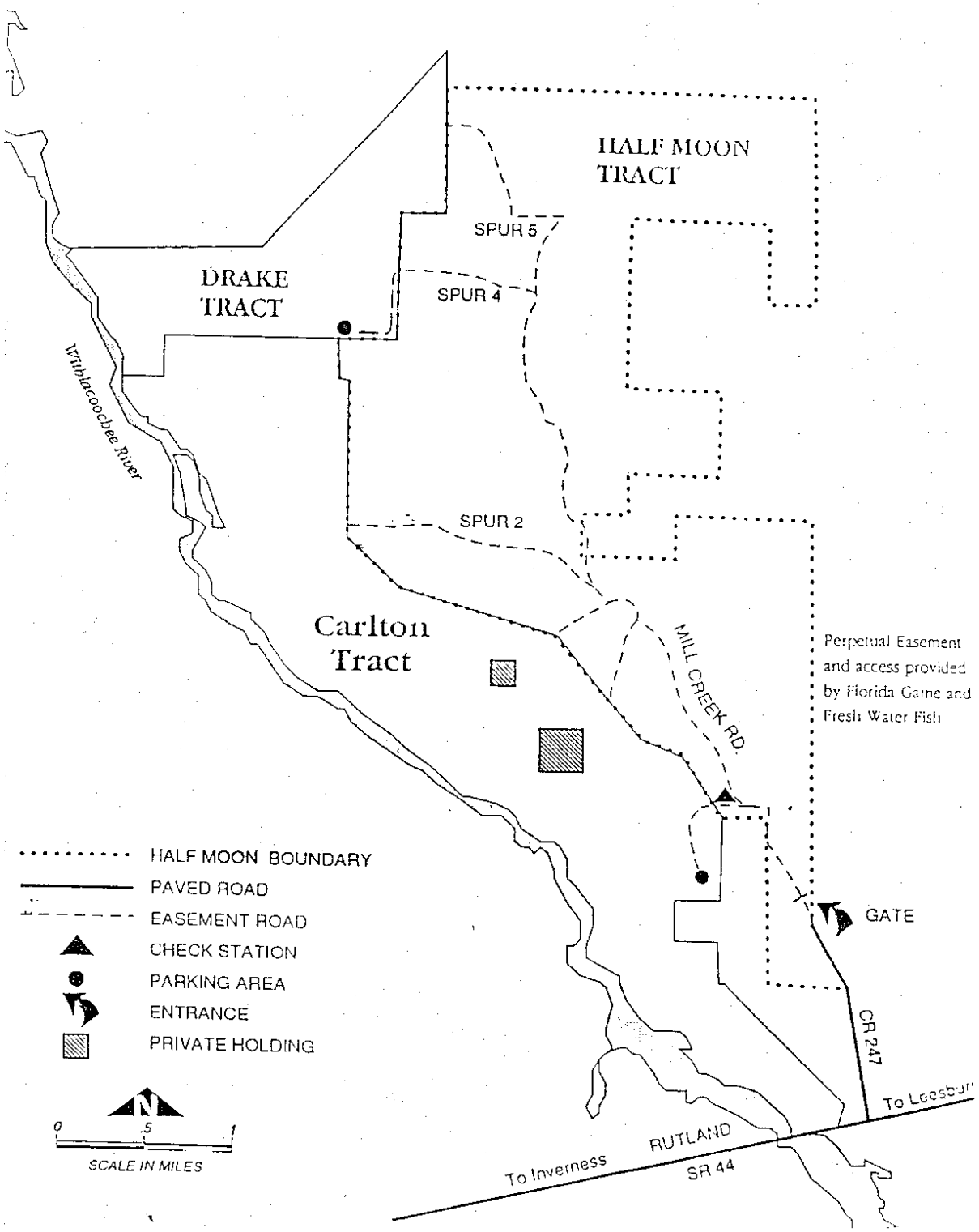

POSTED
WILDLIFE
MANAGEMENT
AREA
STILL HUNT AREA
NO DOGS, GUNS OR TRAPPING
DEVICES ALLOWED WITHOUT
PROPER AUTHORIZATION
FEDERAL AID PROJECT
FLORIDA GAME AND FRESH WATER
FISH COMMISSION

EXHIBIT "F"


HALF MOON TRACT
SPUR 5
DRAKE TRACT
SPUR 4
Withlacoochee River
SPUR 2
Carlton Tract
MILL CREEK RD.
Perpetual Easement and access provided by Florida Game and Fresh Water Fish
HALF MOON BOUNDARY
PAVED ROAD
EASEMENT ROAD
CHECK STATION
PARKING AREA
ENTRANCE
PRIVATE HOLDING
N
0
.5
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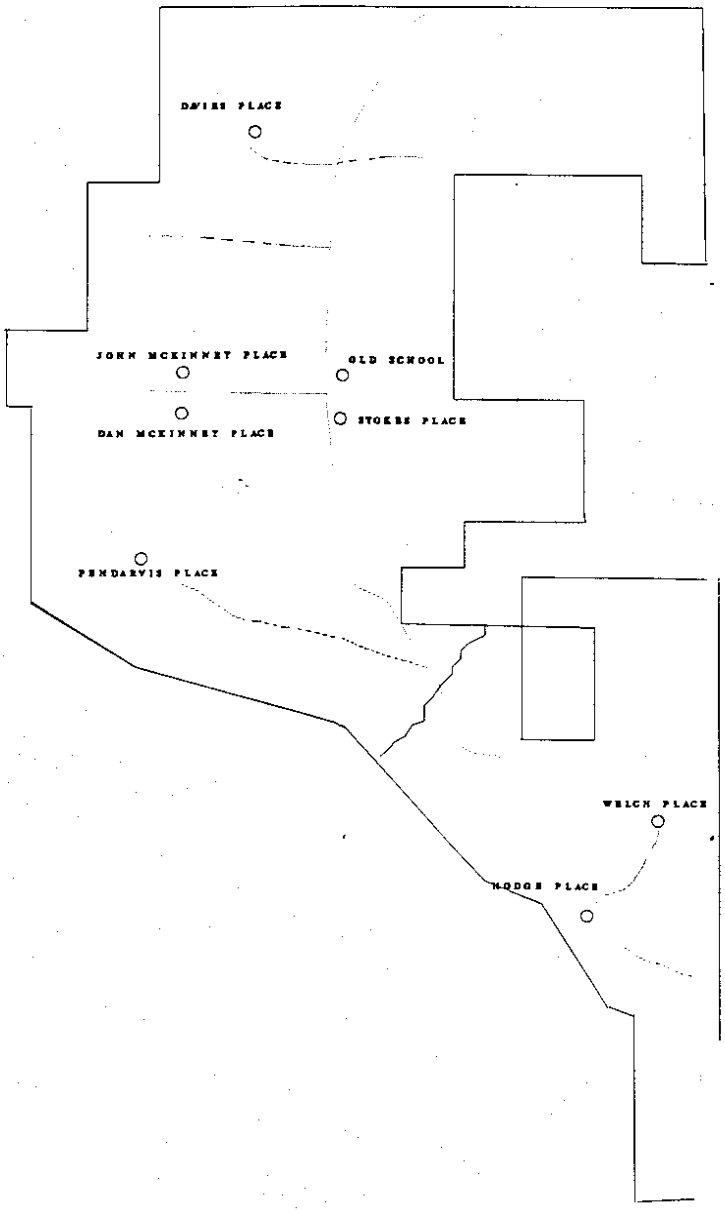
SCALE IN MILES
GATE
CR 247
To Leesbur
To Inverness
RUTLAND
SR 44

APPENDIX III

Homesteads of the early 20th century

APPENDIX VI . HOMESTEADS OF THE EARLY TWENTIETH CENTURY AS REMEMBERED BY MR. J.L. MCKINNEY - DECEMBER 1989.



APPENDIX IV

Soil types and descriptions

Soil types, divided by soil order, are listed along with Natural Resource Conservation Service range site descriptions with the following codes (Yamataki et. al. 1988): OH = Oak Hammock, SFF = South Florida Flatwoods, FM&P = Freshwater Marshes and Ponds, LLP-TO = Longleaf Pine - Turkey Oak Hills, UHH = Upland Hardwood Hammock. Soil orders, types, and associated range sites include:

Histosol - Dominantly organic (peat & muck) over sand marl limestone.

Gator muck (FM&P);

Gator muck, frequently flooded;

Okeelanta muck (FM&P);

Spodosol - Spodic horizon in which organic matter along with aluminum and/or iron has accumulated due to leaching. EauGallie fine sand, bouldery subsurface (SFF);

Electra fine sand, bouldery subsurface (SFF);

Monteocha fine sand, depressional (FM&P);

Oldsmar fine sand, bouldery subsurface (SFF);

Pomello fine sand (SFF);

Smyrna fine sand (SFF);

Vero fine sand, bouldery subsurface (SFF);

Vero fine sand, depressional (FM&P).

Mollisol - Dark, thick surface horizon with a base saturation of 50% or more.

Floridana-Basinger association, frequently flooded;

Floridana mucky fine sand, depressional (FM&P);

Alfisol - Sandy soil over a clay or loam sub horizon with 35% or more base saturation.

Ft. Green fine sand, bouldery subsurface (OH);

Mabel fine sand, bouldery subsurface (UHH);

Paisley fine sand, bouldery subsurface (OH);

Sumterville fine sand, bouldery subsurface (OH);

Ultisol - Sandy material overlying a loamy or clay subsoil

Kendrick fine sand (LLP-TO);

Millhopper sand (OH);

Sparr fine sand (OH);

Sparr fine sand, bouldery subsurface (OH);

Inceptisol - Limited profile differentiation that can take the form of chemical or color change in the subsoil.

Seffner fine sand (OH);

Entisol - Profile development either minor or lacking.

Adamsville fine sand, bouldery subsurface (OH);

Some of the predominant soil series are further described below. (USDA Soil Survey of Sumter County Florida, 1988)

Gator Muck - A soil that is high in organic matter (55% to 85%) and is found in nearly level, very poorly drained areas including ponds, swamps, or marshes. At a depth of 25 inches, pH ranges from 6.1 to 8.4. Permeability is 6 inches per 20 hours and available water capacity is .30 inch of water per .40 inch of soil. Common overstory vegetation includes bald cypress, hickory, red bay, and sweetgum. Understory vegetation includes greenbriar and poison ivy. In gator muck soils underlying freshwater marshes and ponds, pickerelweed, willow, sawgrass, lilies, and other water tolerant plants are common.

EauGallie fine sand - A soil of the broad flatwoods that is nearly level and poorly drained. At a depth of 25 inches, pH ranges from 4.5 to 6.0 , water permeability is 6 inches per 20 hours and available water capacity is .03 inch of water per .08 inch of soil. Organic matter ranges from 1% to 4%. Overstory vegetation includes slash pine, longleaf pine, live oak, and water oak. Other vegetation includes saw palmetto, gallberry, running oak, and pineland threeawn.

Vero sands (both depressional and bouldery) - This is another nearly level poorly drained soil of the flatwoods. At a depth of 21 inches, pH ranges from 5.6 to 8.4, water permeability is .6 inch per 2 hours, and the available water capacity is .10 inch of water per .15 inch of soil. Vegetation common to depressional vero sands includes pickerelweed, maiden-cane, and

various water plants. Bouldery vero sands support slash and longleaf pine with an understory including saw palmetto, gallberry, waxmyrtle, and threeawn.

Sparr fine sand - This soil type is nearly level to gently sloping and is somewhat poorly drained. It is found on broad low ridges and knolls. At 9 to 45 inches, pH ranges from 3.6 to 6.5, permeability is 6 inches per 20 hours, and available water capacity is .05 inch of water per .08 inch of soil. Organic matter is less than 3%. Sparr sands support an overstory of water, live, and scrub oaks. Other vegetation includes pineland threeawn, saw palmetto, and greenbriar.

APPENDIX V

FNAI element occurrence records

FLORIDA NATURAL AREAS INVENTORY

1018 Thomasville Road, Suite 200-C · Tallahassee, Florida 32303 · (904) 224-8207

March 3, 1997

Hugh Boyter
Bureau of Wildlife Management
Division of Wildlife, GFC
620 South Meridian
Tallahassee, Fl 32399-1600

Dear Hugh:

By virtue of this letter we are agreeing that it is unneccesary for your office to request FNAI element data for each management plan you prepare if the following condition is met.

> An update of the Florida Natural Areas Inventory's Biological Conservation Database will be performed on a quarterly basis.

Our database manager, Lance Peterson, will provide the appropriate FGFWFC staff with the updated Biological Conservation Database and your staff will assure that it is incorporated into all management plans. Hopefully, this new procedure will eliminate wasted time and effort at both organizations. Mr. Peterson told me he has provided FGFWFC personnel a database update within the last few weeks so this procedure can begin immediately.

Sincerely,

Gary Knight

Gary Knight, Director
Florida Natural Areas Inventory

cc: Lance Peterson, FNAI
MAF/FGFWFC/general/agreemnt.gfc

FLORIDA NATURAL AREAS INVENTORY

254 East Sixth Avenue • Tallahassee, Florida 32303 • (904) 224-8207

M E M O R A N D U M

TO: Leo Minasian, DNR

FROM: Jim Muller, FNAI

DATE: 21 December 1985

RE: Project design natural resource planning boundary for Carlton Half Moon Ranch CARL project

---

According to the natural resource-based objectives and public purpose outlined in your memo of October 30, 1985, acquisition of Carlton Half Moon Ranch is porposed in order to conserve and protect a natural floodplain and for use as a wildlife management area and/or state forest and/or state park.

The FNAI currently has no element occurrences mapped for this site. From 1972-73 aerial photographs, it appears that the site has large areas of Floodplain Swamp (FNAI Global/State Element Rank G4/S4; explanation sheet attached), Floodplain Forest (FNAI-G4/S4), Hydric Hammock (FNAI-G4/S3), Priarie Hammock (FNAI-G4/S4), Basin Marsh (FNAI-G4/S3), Basin Swamp (FNAI-G5/S4), and Mesic Flatwoods (FNAI-G5/S5). A Spring-run Stream (FNAI-G2/S2) is also reported to be on the site. The quality of the natural communities is unknown, but heavy grazing occurs in the uplands, much of which is pasture.

The original proposal's boundary has been expanded along the northwest to include the Dead River and associated Floodplain Swamp/Floodplain Forest. Along the northern portion, the boundary has been expanded to include Gum Slough and Gum Springs. This is a high quality Spring-run Stream system. North of this system (in Township 17S Range 21E, Sec. 31 and 32 is what appears to be a Sandhill (FNAI-G4/S3) "island". A field survey is necessary to determine which FNAI-listed animals are present, but the area also provides some buffer for Gum Slough.

The eastern border has been expanded slightly to provide additional buffer to wetlands near the boundary of the original proposal.

Disturbed uplands within the original proposed have been included in the natural resource planning boundary for management purposes and because of the effect of these areas on the floodplain.

Fee simple acquisition may not be necessary to protect the entire site. Particularly along the Dead River, conservation easements may be obtainable and would probably be sufficient.

FLORIDA NATURAL AREAS INVENTORY

1018 Thomasville Road, Suite 200-C • Tallahassee, Florida 32303 • (904) 224-8207

14 May 1996

Mr. Stephan G. Stiegler
Florida Game & Fresh Water Fish Commission
Div. of Wildlife, Bryant Bldg., 620 S. Meridian St.
Tallahassee, FL 32399-1600

Dear Mr. Stiegler,

This letter is in reference to your request for information from the Florida Natural Areas Inventory (FNAI). Your data request of 25 April 1996 specified a tract of land in Sumter County. This site is found on the Stokes Ferry, Inverness, Rutland, and Lake Panasoffkee NW USGS 7.5 minute quadrangle.

A search of our maps and computerized database indicates that currently we have the following "Element Occurrence Records" mapped within a 1 mile radius of this area:

Scientific Name	Common Name	Global Rank	State Rank	Fed. Status	State Status	Notes
Natural Communities						
Spring-run Stream		G2	S2	N	N	on site, see record.
Scrub		G2	S2	N	N	on or very near site, see record.
Vertebrates:						
Haliaeetus leucocephalus	Bald Eagle	G4	S3	LT	LT	on site, see record.
Aphelocoma coerulescens coerulescens	Florida Scrub Jay	G5T3	S3	LT	LT	on or very near site, see record.

Your study area is within the boundaries of the Half Moon Wildlife Management area, managed by the Division of Wildlife, Game and Fresh Water Fish Commission, and the Flying Eagle Ranch and Potts Preserve, managed by the Southwest Florida Water Management District.

The enclosed records represent the special elements that occur on the project site. Also enclosed is an element rank explanation sheet defining the FNAI Global/State Ranking and Federal/State legal status of each element.

We strongly suggest that a site specific survey be conducted on this property to determine the current presence or absence of rare, threatened or endangered species. This survey should be conducted by individuals familiar with Florida's flora and fauna. For your convenience, a summary of the elements recorded for Sumter County and a matrix giving seasonal and habitat distributions for the species are enclosed.

The quantity and quality of data collected by the Florida Natural Areas Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site specific field surveys. Many natural areas in Florida have never been thoroughly surveyed, and new species of plants and animals are still being discovered. **For these reasons, FNAI cannot provide a definitive statement on the presence, absence or condition of biological elements in any part of Florida.** Florida Natural Areas Inventory reports summarize the existing information known to FNAI at the time of the request. **They should never be regarded as final statements on the elements or areas being**

considered, nor should they be substituted for on-site surveys required for environmental assessments.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and FNAI must be credited as an information source in these publications. FNAI data may not be resold for profit.

If I can be of further assistance, please call me at (904) 224-8207.

Sincerely,

Barbara Lenczewski

Barbara Lenczewski, Ph.D.
Environmental Reviewer

enclosures

A:\SUMT.STI

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
05/14/96

scientific name: SCRUB
common name:

grank: G2 federal status: N
srank: S2 state status: N

date last observed: 1981-03-05
county name: Citrus

quad name: STOKES FERRY

township and range: 018S020E section: 27 precision: M
town/range comments: NE4

general desc.: OAK ^SCRUB^ BETWEEN HOUSES.

EO data: OCCURRENCE AT SITE

managed area name: POTTS PRESERVE

owner:
owner comments:

best source: COX, J.A. 1981. STATUS & DISTRIBUTION OF THE FLORIDA SCRUB JAY. REPORT TO FLORIDA GAME & FRESH WATER FISH COMMISSION 92 PP.

eonum.: 046

data sens.:

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
05/14/96

scientific name: APHELOCOMA COERULESCENS COERULESCENS
common name: FLORIDA SCRUB JAY

grank: G5T3 federal status: LT
srank: S3 state status: LT

date last observed: 1981-03-05
county name: Citrus

quad name: STOKES FERRY

township and range: 018S020E section: 27 precision: M
town/range comments: NE4

general desc.: OAK ^SCRUB^ BETWEEN HOUSES

EO data: 1981-03-05: 2 SCRUB JAYS

managed area name: POTTS PRESERVE

owner:
owner comments:

best source: COX, J.A. 1981. STATUS & DISTRIBUTION OF THE FLORIDA SCRUB JAY. REPORT TO FLORIDA GAME & FRESH WATER FISH COMMISSION 92 PP.

eonum.: 046

data sens.:

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
05/14/96

scientific name: HALIAEETUS LEUCOCEPHALUS
common name: BALD EAGLE

grank: G4 federal status: LT
srank: S2S3 state status: LT

date last observed: 1988
county name: Sumter

quad name: STOKES FERRY

township and range: 018S020E section: 23 precision: M
town/range comments: NE4

general desc.:

EO data: NEST: 1976-1983 ACTIVE. FLEDGED YOUNG 1982-1983 UNKNOWN.

managed area name: HALF MOON WILDLIFE MANAGEMENT AREA

owner:
owner comments:

best source: FLORIDA GAME AND FRESH WATER FISH COMMISSION. 1988. BALD EAGLE NEST SURVEY SUMMARY.

eonum.: 566

data sens.:

FLORIDA NATURAL AREAS INVENTORY - ELEMENT OCCURRENCE RECORD
05/14/96

scientific name: SPRING-RUN STREAM
common name:

grank: G2 federal status: N
srank: S2 state status: N

date last observed: 1984-02-20
county name: Sumter , Marion

quad name: LAKE PANASOFFKEE NW , STOKES FERRY

township and range: 018S021E section: 06 precision: SC
town/range comments: SEC 5,7,12,13,14/MARI CO T17S SEC 32.

general desc.: PARTIAL CANOPY FROM ^FLOODPLAIN SWAMP^ (ACER RUBRUM, TAXODIUM DISTICHUM, FRAXINUS CARDINIANA(?)., CORNUS FOEMINA(?), MYRICA CERIFERA, SALIX SP., SAMBUCUS CANADENSIS).

EO data: FED BY SEVEN SPRINGS; SUBSTRATE OF LIMEROCK OUTCROPS, COARSE SAND AND FINE LAYER OF ORGANICS; LOTIC ZONE: SAG. KURZIANA, VAL. AMERICANA, CHARA SP, NAJAS SP, NAS. OFFICINALE; LITTORAL ZONE: CLA. JAMAICENSE, SAG. LANCIFOLIA, CIC. MEXICANA.

managed area name: HALF MOON WILDLIFE MANAGEMENT AREA

owner: MCGREGOR SMITH
owner comments: OWNERS KNOWLEDGABLE OF RECENT HISTORY AND WILLING TO PROTECT.

best source: BRINSON, S.T. AND J. SMITH. 1984. FIELD SURVEY OF GUM SLOUGH AND SPRING AT HEADWATERS, SUMTER CO., FL, ON FEBRUARY 20, 1984.

eonum.: 061

data sens.:

Guide to the County Matrix of Habitats and Distribution of Rare/Endangered Species in Florida

Florida Natural Areas Inventory

INTRODUCTION

Florida has more federally listed endangered and threatened species than any other state east of the Mississippi River. The Florida Natural Areas Inventory (FNAI) maintains a geographical and biological data base on known occurrences of rare species, including all (except whales) Federal- and most State-listed species. However, all potential habitat for these species cannot be surveyed due to limitations of time and money. To provide planners, land managers and government decision-makers with an efficient method to determine whether a decision may impact the potential habitat of an endangered or rare species, a species by county by habitat matrix was assembled from currently available information. The matrix allows users to determine quickly which rare/endangered species are likely to occur in a particular county, in which habitat(s) to expect those species, and at what time of year to search for them. For local use, the data were also assembled as matrices for each county. The matrices will be updated periodically to reflect current knowledge of distribution, status, and taxonomy. Users of the matrices are encouraged to submit suggested revisions to the FNAI.

We reviewed the following sources in assembling the matrix: the FNAI data base, *Rare and Endangered Biota of Florida*, volumes 1-5, species checklists, field surveys, journal articles, floras, herbarium records, field guides, and other literature (a reference list is available from FNAI). Habitat descriptions are referenced to *Guide to the Natural Communities of Florida* (Florida Natural Areas Inventory & Florida Department of Natural Resources 1990). Brief descriptions of all natural communities are available from FNAI. We primarily used *Checklist of Florida's Birds* (Stevenson n.d.) to determine the seasonal presence of birds.

MATRIX EXPLANATION

Natural community

The natural communities (NC) (= habitat) given for each species are those most frequently inhabited by or most likely to contain the species. Comments regarding habitat follow a specific NC if they apply only to that NC. If the annotation applies to all NCs given, it is incorporated into the Comments portion of the Habitat field. Because the NCs listed necessarily apply to the statewide distribution of each species, they may include more habitats than occupied at the local level. Because of their high mobility, some animals may enter communities other than those listed. For especially wide-ranging species (such as the Florida panther) which may occupy a multitude of natural community types, we identify habitat only broadly. More than one level is used for certain species; roosting and maternal habitats of bats are defined specifically (e.g., Terrestrial Cave), while their foraging habitat is defined more broadly (e.g., Terrestrial). Some amphibians reproduce in ephemeral bodies of water which are not recognized in the habitat categorization employed. For these species, the natural community types are annotated by the phrase, "reproduces in ephemeral wetlands within this community." Likewise, the term "ruderal" is used as a NC type for those species that sometime utilize man-made habitats (e.g., ditches, canals, canal banks, abandoned quarries, dredge spoil, trash piles, pine plantations, citrus groves, roof tops, bridges, buildings, pastures and old fields).

Seasonal Distribution

The seasonal presence or recognizability of a taxon is denoted in the matrix by a horizontal calendar. The first and second halves of each month are indicated by "A" (days 1-15) and "B" (days 16-31), respectively. For plants, seasonal distribution indicates the time of year

when taxonomic identification can be determined from vegetative (V), flowering (F), or fruiting (Fr) parts. For animals, a "P" (present) indicates those months in which the species can be found in Florida or most easily located within its preferred habitat. Seasonal values shown in the matrix are from a statewide perspective; local variations may occur. Many amphibians are cryptic in their habits and can be found reliably only during the reproductive season; we have indicated this in the matrix calendar for these species. The seasonal variation in distribution of birds between north and south Florida required the use of two calendars for particular species. Those instances for which certain birds have been recorded beyond their normal seasonal period are indicated by a (+). Additional comments regarding seasonal presence of certain plants and animals are included in the matrix.

County Status

County distributions are presented as "R" (reported), "C" (confirmed), or "?" (questionable plant identification). A plant's presence in a county is confirmed if there is a documented record in the FNAI data base, an existing herbarium record, or specific mention by county name in a technical publication. Plant records derived from interpretations of general maps or from unpublished reports are considered reported only. Vertebrate records are considered confirmed only for cases in which the FNAI data base contains an occurrence record for that county; all other records are considered as reported only. In general, confirmed bird records are based on sites used for nesting, feeding, or roosting. The matrix includes comments regarding county distribution where appropriate. Data for rare species are addressed by FNAI on the basis of global rarity; the rarest species, therefore, will tend to have more confirmed records than the more abundant species.

ACKNOWLEDGEMENTS

Ann F. Johnson (plants) and John G. Palis (vertebrates) compiled the matrix data. Patricia Braley of the national office of The Nature Conservancy provided computer assistance. Katy NeSmith and Mary L. Lubinski of FNAI computerized the matrix worksheets and produced the matrix format. David Addison, W. Wilson Baker, Joseph Bruner, Charles Chase, James A. Cox, Robert K. Godfrey, David Hall, Roger L. Hammer, E. Dennis Hardin, Alan Herndon, Stephen R. Humphrey, Michael LeLong, Charles McCartney, Paul E. Moler, Clifton Nauman, Katy NeSmith, Tom Patrick, Kent Perkins, John Popenoe, and Richard P. Wunderlin provided assistance in assembling the matrix data. The herbaria of Angus Gholson, Archbold Biological Station, Fairchild Tropical Garden, Florida Atlantic University, Florida State University, Marie Selby Botanical Gardens, University of Florida, University of South Florida, and University of West Florida were also employed. Vicki Garland typed a portion of the manuscript. Dale R. Jackson edited the manuscript text.

An element is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element. The major function of the Florida Natural Areas Inventory is to define the state's elements of natural diversity, then collect information about each element occurrence.

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

FNAI GLOBAL ELEMENT RANK (priority)

G1 = Critically imperiled globally of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,0000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.

G4 = apparently secure globally (may be rare in parts of range)

G5 = demonstrably secure globally

GH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)

GX = believed to be extinct throughout range

GXC = extirpated from the wild but still known from captivity/cultivation

G#? = tentative rank (e.g., G2?)

G#G# = range of rank; insufficient data to assign specific global rank (e.g., G2G3)

G#T# = rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)

G#Q = rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)

G#T#Q = same as above, but validity as subspecies or variety is questioned.

GU = due to lack of information, no rank or range can be assigned (e.g., GUT2)

G? = not yet ranked (temporary)

FNAI STATE ELEMENT RANK (priority)

Definition parallels global element rank; substitute "S" for "G" in above global ranks, and "in Florida" for "globally" in above global rank definitions.

Additional state element ranks:

SA = accidental in Florida, i.e., not part of the established biota

SE = an exotic species established in Florida may be native elsewhere in North America

SN = regularly occurring, but widely and unreliably distributed; sites for conservation hard to determine

FEDERAL LEGAL STATUS (U. S. Fish and Wildlife Service- USFWS)

LE = Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species which is in danger of extinction throughout all or a significant portion of its range.

PE = Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.

LT = Listed as Threatened Species. Defined as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

PT = Proposed for listing as Threatened Species.

C1 = Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants, Category 1. Taxa for which the USFWS currently has substantial information on hand to support the biological appropriateness of proposing to list the species as endangered or threatened.

C2 = Candidate Species, Category 2. Taxa for which information now in possession of the USFWS indicates that proposing to list the species as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat(s) are not currently available to support proposed rules at this time.

3A = Category 3A. Taxa which are no longer being considered for listing as endangered or threatened because of persuasive evidence of extinction.

3B = Category 3B. Taxa which are no longer being considered for listing as endangered or threatened because the names do not represent taxa meeting the Endangered Species Act's definition of "species."

3C = Category 3C. Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

AC = Agency Concern. Species which are not currently listed or candidates, but which are a matter of concern to the USFWS.

T/SA = Threatened due to similarity of appearance.

N = Not currently listed, nor currently being considered for addition to the List of endangered and Threatened Wildlife and Plants.

STATE LEGAL STATUS

Animals (Florida Game and Fresh Water Fish Commission- FGFWFC)

LE = Listed as Endangered Species by the FGFWFC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.

LT = Listed as Threatened Species by the FGFWFC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.

LS = Listed as Species of Special Concern by the FGFWFC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

N = Not currently listed, nor currently being considered for listing.

Plants (Florida Department of Agriculture and Consumer Services- FDACS)

LE = Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.

PE = Proposed by the FDACS for listing as Endangered Plants.

LT = Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

PT = Proposed by the FDACS for listing as Threatened Plants.

CE = Listed as a Commercially Exploited Plant in the Preservation of Native Flora of Florida Act. Defined as species native to state which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

PC = Proposed by the FDACS for listing as Commercially Exploited Plants.

(LT) = Listed threatened as a member of a larger group but not specifically listed by species name.

N = Not currently listed, nor currently being considered for listing.

FLORIDA NATURAL AREAS INVENTORY
1018 Thomasville Road, Suite 200-C
Tallahassee, FL 32303
(904) 224-8207 , FAX: (904) 681-9364

November 1995

Sumter County Summary

Occurrence Records currently in the FNAI database

SCIENTIFIC NAME	COMMON NAME	FNAI GLOBAL RANK	FNAI STATE RANK	FED STATUS	STATE STATUS	# FNAI Recorded Locations
REPTILES						
Alligator mississippiensis	American Alligator	G5	S4	T/SA	LS	1
Crotalus adamanteus	Eastern Diamondback Rattlesnake	G5	S?	N	N	1
Drymarchon corais couperi	Eastern Indigo Snake	G4T3	S3	LT	LT	1
Gopherus polyphemus	Gopher Tortoise	G3	S3	C2	LS	6
Pituophis melanoleucus mugitus	Florida Pine Snake	G5T3?	S3	C2	LS	1
BIRDS						
Aphelocoma coerulescens coerulescens	Florida Scrub Jay	G5T3	S3	LT	LT	5
Casmerodius albus	Great Egret	G5	S4	N	N	1
Egretta caerulea	Little Blue Heron	G5	S4	N	LS	1
Eudocimus albus	White Ibis	G5	S4	N	LS	1
Haliaeetus leucocephalus	Bald Eagle	G4	S2S3	LT	LT	5
Mycteria americana	Wood Stork	G4	S2	LE	LE	1
MAMMALS						
Myotis austroriparius	Southeastern Bat	G4	S?	C2	N	1
Sciurus niger shermani	Sherman's Fox Squirrel	G5T2	S2	C2	LS	2
INVERTEBRATES						
Aphaostracon xynoelictus	Fenney Springs Hydrobe	G1	S1	C2	N	1
PLANTS						
Dicerandra cornutissima	Longspurred Mint	G1	S1	LE	LE	1
Eriogonum longifolium var gnaphalifolium	Scrub Buckwheat	G4T3	S3	LT	LT	1
Justicia cooleyi	Cooley's Water-willow	G1G2	S1S2	LE	LE	1
Peperomia humilis	Terrestrial Peperomia	G5	S2	N	LE	1
NATURAL COMMUNITIES						
Baygall		G4?	S4?	N	N	1
Spring-run Stream		G2	S2	N	N	1

NATURAL COMMUNITIES (Cont.)

Terrestrial Cave	G3	S1	N	N	1
Mesic Flatwoods	G?	S4	N	N	1
Scrub	G2	S2	N	N	2
Upland Hardwood Forest	G?	S3	N	N	4

OTHER

Bird rookery			N	N	3

TOTAL COUNT:

Total Tracked taxa tallied:	25
Total Summary Occurences:	45

DISTRIBUTION OF RARE/ENDANGERED SPECIES IN SUMTER COUNTY, FLORIDA (Florida Natural Areas Inventory, December 1989)

List is organized by Special Plants, in alphabetical order, followed by Vertebrates listed alphabetically within class.
County Status: C = confirmed R = reported ? = specimen available but may be incorrectly identified Habitat: see FNAI community classification
Seasonal Distribution: Plants- F = flowering Fr = fruiting V = vegetative Animals- P = present (see text) (+) = records outside expected period (birds only)
(seasonal distribution is based on statewide data, not data specific to this county)

SPECIAL PLANTS

ASPLENIUM AURITUM (AURICLED SPLEENWORT) County Status: C
HABITAT: PALUSTRINE: Slough , Hydric Hammock COMMENTS: epiphytic on trees

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

ASPLENIUM X PLENUM C
HABITAT: TERRESTRIAL: Rockland Hammock COMMENTS: terrestrial cave; on limestone

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

DICERANDRA CORNUTISSIMA (LONGSPURRED MINT) C
HABITAT: TERRESTRIAL: Sandhill, Scrub COMMENTS: paths

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
																		F	F	F				

ERIOGONUM LONGIFOLIUM VAR GNAPHALIFOLIUM (SCRUB BUCKWHEAT) C
HABITAT: TERRESTRIAL: Sandhill , Scrub

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

JUSTICIA COOLEYI (COOLEY'S WATER-WILLOW) R
HABITAT: TERRESTRIAL: Upland Mixed Forest

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
															F	F	F	F	F	F	F	F	F	F

PEPEROMIA HUMILIS (TERRESTRIAL PEPEROMIA) C
HABITAT: TERRESTRIAL: Maritime Hammock , Upland Hardwood Forest PALUSTRINE: Slough , Hydric Hammock MARINE: Marine Tidal Swamp ESTUARINE: Estuarine Tidal Swamp
COMMENTS: rarely epiphytic; usually on thin humus over calcareous substrate

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	F	F													F	F	F	F	F	F	F	F	F	F

RHYNCHOSIA CINEREA (BROWN-HAIRED SNOUTBEAN) C
HABITAT: TERRESTRIAL: Pine Rocklands, Beach Dune, Scrub, Sandhill , Mesic Flatwoods COMMENTS: roadsides, fields

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

List is organized by Special Plants, in alphabetical order, followed by Vertebrates listed alphabetically within class.
County Status: C = confirmed R = reported ? = specimen available but may be incorrectly identified Habitat: see FNAI community classification
Seasonal Distribution: Plants- F = flowering Fr = fruiting V = vegetative Animals- P = present (see text) (+) = records outside expected period (birds only)
(seasonal distribution is based on statewide data, not data specific to this county)

SPECIAL PLANTS (cont.)

SPIGELIA LOGANIOIDES (A PINKROOT) C
HABITAT: PALUSTRINE: Hydric Hammock (under hardwoods) , Bottomland Forest

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
								F	F	F	F	F												

TRICHOMANES PETERSII (PLATEAU BRISTLE FERN) C
HABITAT: TERRESTRIAL: Upland Hardwood Forest COMMENTS: on limestone

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

TRICHOMANES PUNCTATUM (FLORIDA BRISTLE FERN) C
HABITAT: TERRESTRIAL: Sinkhole , Upland Hardwood Forest COMMENTS: on tree bases or on limestone

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

ZEPHYRANTHES SIMPSONII (RAIN LILY) C
HABITAT: PALUSTRINE: Dome Swamp , Wet Flatwoods COMMENTS: ditches, wet pastures; often in burned over areas

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	F	F	F	F	F	F	F	F	F	F	F	F												

List is organized by Special Plants, in alphabetical order, followed by Vertebrates listed alphabetically within class.
County Status: C = confirmed R = reported ? = specimen available but may be incorrectly identified Habitat: see FNAI community classification
Seasonal Distribution: Plants- F = flowering Fr = fruiting V = vegetative Animals- P = present (see text) (+) = records outside expected period (birds only)
(seasonal distribution is based on statewide data, not data specific to this county)

AMPHIBIANS

AMBYSTOMA TIGRINUM (TIGER SALAMANDER) R

HABITAT: TERRESTRIAL: Upland Mixed Forest, Mesic Flatwoods, Upland Pine Forest , Ruderal (reproduces in ephemeral wetlands within these communities) PALUSTRINE: Basin Marsh, Depression Marsh LACUSTRINE: Ruderal, Flatwoods/Prairie Lake, Marsh Lake , Sandhill Upland Lake

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
ADULTS:	P	P	P	P	P	P																P	P	P
LARVAE:	P	P	P	P	P																		P	P

NOTOPHTHALMUS PERSTRIATUS (STRIPED NEWT) R

HABITAT: TERRESTRIAL: Mesic Flatwoods, Sandhill, Scrub , Scrubby Flatwoods (ephemeral wetlands within these communities) LACUSTRINE: Sinkhole Lake, Sandhill Upland Lake, Flatwoods/Prairie Lake , Marsh Lake

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PSEUDOBRANCHUS STRIATUS LUSTRICOLUS (GULF HAMMOCK DWARF SIREN) R

HABITAT: PALUSTRINE: Dome Swamp, Depression Marsh, Basin Marsh , Basin Swamp LACUSTRINE: River Floodplain Lake, Flatwoods/Prairie Lake, Marsh Lake , Swamp Lake

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

RANA AREOLATA (GOPHER FROG) R

HABITAT: TERRESTRIAL: Sandhill, Scrub, Scrubby Flatwoods, Xeric Hammock (reproduces in ephemeral wetlands within these communities) LACUSTRINE: Ruderal, Sandhill Upland Lake

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
AD. (calling):	P	P	P	P	P	P	P	P	P	P	P	P					P	P			P	P		
TADPOLES:	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

REPTILES

ALLIGATOR MISSISSIPPIENSIS (AMERICAN ALLIGATOR) R

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

DRYMARCHON CORAIS COUPERI (EASTERN INDIGO SNAKE) R

HABITAT: TERRESTRIAL: Mesic Flatwoods, Upland Pine Forest, Sandhill, Scrub, Scrubby Flatwoods, Rockland Hammock , Ruderal PALUSTRINE: Hydric Hammock , Wet Flatwoods ESTUARINE: Estuarine Tidal Swamp

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

DISTRIBUTION OF RARE/ENDANGERED SPECIES IN SUMTER COUNTY, FLORIDA (Florida Natural Areas Inventory, December 1989)

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REPTILES (cont.)

GOPHERUS POLYPHEMUS (GOPHER TORTOISE) C
HABITAT: TERRESTRIAL: Sandhill, Scrub, Scrubby Flatwoods, Xeric Hammock, Coastal Strand , Ruderal

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PSEUDEMYS CONCINNA SUWANNIENSIS (SUWANNEE COOTER) R
HABITAT: RIVERINE: Alluvial Stream, Blackwater Stream , Spring-Run Stream

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

STILOSOMA EXTENUATUM (SHORT-TAILED SNAKE) R
HABITAT: TERRESTRIAL: Sandhill, Scrub , Xeric Hammock

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

BIRDS

ACCIPITER COOPERII (COOPER'S HAWK) R
HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

AIMOPHILA AESTIVALIS (BACHMAN'S SPARROW) R
HABITAT: TERRESTRIAL: Various Terrestrial Habitats , Ruderal

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

APHELOCOMA COERULESCENS COERULESCENS (FLORIDA SCRUB JAY) C
HABITAT: TERRESTRIAL: Scrub , Scrubby Flatwoods

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

ARAMUS GUARAUNA (LIMPKIN) R
HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

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BIRDS (cont.)

BUTEO BRACHYURUS (SHORT-TAILED HAWK) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

CASMERODIUS ALBUS (GREAT EGRET) C

HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

EGRETTA CAERULEA (LITTLE BLUE HERON) C

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

EGRETTA THULA (SNOWY EGRET) R

HABITAT: PALUSTRINE: Various Palustrine Habitats , Ruderal LACUSTRINE: Various Lacustrine Habitats , Ruderal RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

EGRETTA TRICOLOR (TRICOLORED HERON) R

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

EUDOCIMUS ALBUS (WHITE IBIS) C

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

FALCO COLUMBARIUS (MERLIN) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P							P	P	P	P	P	P	P	P

COMMENTS: most often seen during migration

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BIRDS (cont.)

FALCO PEREGRINUS (PEREGRINE FALCON) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats , Ruderal PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
NORTH:	P	P	P	P	P	P	P	P	P	P	(+)					(+)	P	P	P	P	P	P	P	P
SOUTH:	P	P	P	P	P	P	P	P	P	P							P	P	P	P	P	P	P	P

COMMENTS: most often seen during migration; uncommon in winter

FALCO SPARVERIUS PAULUS (SOUTHEASTERN AMERICAN KESTREL) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats , Ruderal PALUSTRINE: Various Palustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

COMMENTS: best identified between May and August (breeding season)

GRUS CANADENSIS PRATENSIS (FLORIDA SANDHILL CRANE) R

HABITAT: TERRESTRIAL: Dry Prairie , Ruderal PALUSTRINE: Swale, Basin Marsh, Depression Marsh, Bog, Marl Prairie , Wet Prairie LACUSTRINE: Flatwoods/Prairie Lake , Marsh Lake

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) C

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

IXOBRYCHUS EXILIS (LEAST BITTERN) R

HABITAT: PALUSTRINE: Basin Marsh, Depression Marsh, Swale , Floodplain Marsh LACUSTRINE: Marsh Lake MARINE: Marine Tidal Marsh ESTUARINE: Marine Tidal Marsh

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
NORTH:				(+)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	(+)	
SOUTH:	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

LATERALLUS JAMAICENSIS (BLACK RAIL) R

HABITAT: PALUSTRINE: Basin Marsh, Depression Marsh, Swale , Floodplain Marsh LACUSTRINE: Marsh Lake MARINE: Marine Tidal Marsh ESTUARINE: Estuarine Tidal Marsh

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

COMMENTS: range not well known

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BIRDS (cont.)

MYCTERIA AMERICANA (WOOD STORK) C

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
NORTH:	(+)			(+)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
SOUTH:	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

NYCTANASSA VIOLACEA (YELLOW-CROWNED NIGHT-HERON) R

HABITAT: PALUSTRINE: Various Palustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
NORTH:				(+)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	(+)			
SOUTH:	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

NYCTICORAX NYCTICORAX (BLACK-CROWNED NIGHT-HERON) R

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PANDION HALIAETUS (OSPREY) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats , Ruderal PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats RIVERINE: Various Riverine Habitats MARINE: Near Shore ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PICOIDES VILLOSUS (HAIRY WOODPECKER) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PLEGADIS FALCINELLUS (GLOSSY IBIS) R

HABITAT: PALUSTRINE: Various Palustrine Habitats LACUSTRINE: Various Lacustrine Habitats ESTUARINE: Various Estuarine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

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MAMMALS

MUSTELA FRENATA PENINSULAE (FLORIDA LONG-TAILED WEASEL) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

NEOFIBER ALLENI (ROUND-TAILED MUSKRAT) R

HABITAT: PALUSTRINE: Floodplain Marsh, Swale, Depression Marsh , Basin Marsh LACUSTRINE: Marsh Lake , Flatwoods/Prairie Lake ESTUARINE: Estuarine Tidal Marsh

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PLECOTUS RAFINESQUII (SOUTHEASTERN BIG-EARED BAT) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats , Ruderal PALUSTRINE: Various Palustrine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

PODOMYS FLORIDANUS (FLORIDA MOUSE) R

HABITAT: TERRESTRIAL: Scrub, Sandhill , Scrubby Flatwoods

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

SCIURUS NIGER SHERMANI (SHERMAN'S FOX SQUIRREL) C

HABITAT: TERRESTRIAL: Sandhill, Mesic Flatwoods , Scrubby Flatwoods PALUSTRINE: Dome Swamp , Baygall

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

SOREX LONGIROSTRIS LONGIROSTRIS (SOUTHEASTERN SHREW) R

HABITAT: PALUSTRINE: Floodplain Forest , Floodplain Swamp

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

URSUS AMERICANUS FLORIDANUS (FLORIDA BLACK BEAR) R

HABITAT: TERRESTRIAL: Various Terrestrial Habitats PALUSTRINE: Various Palustrine Habitats

SEASONAL DIST.:	JanA	JanB	FebA	FebB	MarA	MarB	AprA	AprB	MayA	MayB	JunA	JunB	JulA	JulB	AugA	AugB	SepA	SepB	OctA	OctB	NovA	NovB	DecA	DecB
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

APPENDIX VI

Vascular flora of Half Moon WMA

VASCULAR FLORA OF HALF MOON WILDLIFE MANAGEMENT AREA

SUMTER COUNTY, FLORIDA

DIVISION PTERIDOPHYTA

FAMILY BLECHNACEAE

Woodwardia virginica - Virginia Chain Fern

FAMILY LYCOPODIACEAE

FAMILY POLYPODIACEAE

Polypodium polypodioides - Resurrection Fern

FAMILY PTERIDACEAE

Pteridium aquilinum - Bracken Fern

DIVISION SPERMATOPHYTA

CLASS GYMNOSPERMAE

FAMILY CUPRESSACEAE

Juniperus silicicola - Southern Red Cedar

FAMILY CYCADACEAE

Zamia pumila - Coontie

FAMILY PINACEAE

Pinus clausa - Sand pine

Pinus elliottii - Slash Pine

Pinus palustris - Longleaf Pine

Pinus taeda - Loblolly Pine

FAMILY TAXODIACEAE

Taxodium ascendens - Pond Cypress

Taxodium distichum - Baldcypress

CLASS ANGIOSPERMAE

SUBCLASS MONOCOTYLEDONAE

FAMILY AGAVACEAE

Yucca aloifolia - Spanish Dagger

Yucca filamentosa - Bear Grass

FAMILY ALISMATACEAE

Sagittaria graminea - Dwarf Duck-Potato

Sagittaria lancifolia - Duck-Potato

Sagittaria latifolia - Common Arrowhead

FAMILY ARACEAE

Pistia stratiotes - Water-Lettuce

FAMILY ARECACEAE

Sabal minor - Dwarf Palmetto

Sabal palmetto - Cabbage Palmetto

Serenoa repens - Saw Palmetto

FAMILY BROMELIACEAE

Tillandsia usneoides - Spanish Moss

FAMILY COMMELINACEAE

FAMILY CYPERACEAE

Cladium jamaicense - Sawgrass

Cyperus odoratus - Flat-Sedge

Dichromena colorata - White-top Sedge

Rhynchospora sp. - Beak Rush

FAMILY ERIOCAULACEAE

Eriocaulon decangulare - Pipewort

FAMILY HAEMODORACEAE

Lachnanthes caroliniana - Bloodroot

FAMILY HYDROCHARTITACEAE

Limnobium spongia - Frog's-bit

FAMILY IRIDACEAE

Iris hexagona - Prairie Iris

Sisyrinchium angustifolium - Blue-Eyed Grass

FAMILY ORCHIDACEAE

Spiranthes praecox - Grass-Leaved Ladies' Tresses

FAMILY POACEAE

Andropogon calliipes - Chalky Bluestem

Andropogon glomeratus - Bushy Bluestem

Andropogon virginicus - Broomsedge

Aristida stricta - Pineland Threeawn

Cenchrus sp. - Sandspur

Digitaria decumbens - Pangolagrass

Panicum hemitomon - Maiden-cane

Paspalum notatum - Bahiagrass

Sorghastrum secundum - Lopsided Indiangrass

Spartina bakeri - Sand Cordgrass

Zizaniopsis miliacea - Southern Wild Rice, Water Millet

FAMILY PONTEDERIACEAE

Eichhornia crassipes - Water Hyacinth

Pontederia cordata - Pickerelweed

FAMILY SMILACEAE

Smilax laurifolia - Catbrier

Smilax tamnoides - Catbrier

FAMILY TYPHACEAE

Typha latifolia - Common Cattail

FAMILY XYRIDACEAE

Xyris elliottii - Yellow-Eyed Grass

SUBCLASS DICOTYLEDONAE

FAMILY ACANTHACEAE

Ruellia caroliniensis - Wild Petunia

FAMILY ACERACEAE

Acer rubrum - Southern Red Maple

FAMILY ANACARDIACEAE

Toxicodendron copallina - Winged Sumac

Toxicodendron radicans - Poison Ivy

FAMILY ANNONACEAE

Asimina angustifolia - Pawpaw

Asimina parviflora - Acuminate Pawpaw

Asimina reticulata - Pawpaw

FAMILY APIACEAE

Hydrocotyle umbellata - Marsh Pennywort

FAMILY AQUIFOLIACEAE

Ilex coriacea - Large Gallberry

Ilex glabra - Gallberry

Ilex opaca - American Holly

Ilex vomitoria - Yaupon

FAMILY ARALIACEAE

Aralia spinosa - Devil's Walking Stick

FAMILY ASCLEPIADACEAE

Asclepias lanceolata - Pond Milkweed

Asclepias tuberosa - Butterfly-Weed

FAMILY ASTERACEAE

Aster carolinianus - Climbing Aster

Baccharis halimifolia - Sea Myrtle

Bidens alba - Begger-Ticks

Carduus repandus - Thistle

Cirsium horridulum - Thistle

Elephantopus elatus - Florida Elephant's Foot

Erechtites hieracifolia - Fireweed

Erigeron quercifolius - Southern Fleabane

Eupatorium capillifolium - Dog Fennel

Gnaphalum obtusifolium - Rabbit Tobacco

Helianthus angustifolius - Sunflower

Heterotheca subaxillaris - Camphorweed

Krigia virginica - Dwarf Dandelion

Liatris spicata - Blazing Star

Pluchea rosea - Marsh-Fleabane

Pterocaulon virgatum - Blackroot

Solidago chapmanii - Goldenrod

Carphephorus odoratissima - Vanilla-Plant, Deer's Tongue

Wedelia trilobata - Creeping Oxeye

FAMILY BRASSICACEAE

Lepidium virginicum - Poorman's Pepper

Raphanus raphanistrum - Wild Radish

FAMILY BETULACEAE

Carpinus caroliniana - Ironwood

Ostrya virginiana - Hophornbeam

FAMILY BIGNONIACEAE

Campsis radicans - Trumpet-Vine

FAMILY CACTACEAE

Opuntia humifusa - Prickly-Pear Cactus

FAMILY CALYCANTHACEAE

Calycanthus floridus - Sweet-Shrub

FAMILY CAPRIFOLIACEAE

Sambucus canadensis - Elderberry

FAMILY CHRYSOBALANACEAE

Licania michauxii - Gopher Apple

FAMILY CISTACEAE

Helianthemum corymbosum - Frostweed

FAMILY CONVOLVULACEAE

Ipomea sagittata - Morning-Glory

FAMILY CORNACEAE

Cornus florida - Flowering Dogwood

FAMILY CUCURBITACEAE

Melothria pendula - Creeping Cucumber

FAMILY DROSERACEAE

Drosera capillaris - Pink Sundew

FAMILY EBENACEAE

Diospyros virginiana - Persimmon

FAMILY ERICACEAE

Befaria racemosa - Tarflower

Gaylussacia nana - Dangleberry

Lyonia ferruginea - Rusty Lyonia

Lyonia lucida - Fetterbush

Vaccinium arboreum - Sparkleberry

Vaccinium corymbosum - Highbush Blueberry

Vaccinium myrsinites - Shiny Blueberry

FAMILY EUPHORBIACEAE

Cnidoscolus stimulosus - Tread Softly

Stillingia sylvatica - Queen's Delight

FAMILY FABACEAE

Amorpha fruticosa - Bastard-Indigo

Baptisia lecontei - Baptisia

Cassia fasciculata - Showy Partidgepea

Cassia obtusifolia - Sicklepod

Cassia occidentalis - Coffee Senna

Centrosema virginianum - Butterfly-Pea

Crotalaria sagittalis - Sagittate Rattlebox

Crotalaria spectabilis - Rattlebox

Desmodium incanum - Big-leaved Prostrate Paniculate Desmo

Erythrina herbacea - Coralbeans

Galactia volubilis - Milkpea

Lespedeza striata - Common Lespedeza

Indigofera caroliniana

Indigofera hirsuta - Hairy Indigo

Rhynchosia reniformis - Dollar Weed

Sesbania exalta - Sesbania

Sesbania vesicaria - Bladderpod (Glottidium)

Tephrosia florida - Goat's Rue

Trifolium repens - White Clover

FAMILY FAGACEAE

Quercus geminata - Sand Live Oak

Quercus incana - Blue-Jack Oak

Quercus laevis - Turkey Oak

Quercus laurifolia - Laurel Oak

Quercus margaretta - Sand Post Oak

Quercus minima - Dwarf Live Oak

Quercus myrtifolia - Myrtle Oak

Quercus nigra - Water Oak

Quercus pumila - Running Oak

Quercus virginiana - Live Oak

FAMILY GERANIACEAE

Geranium carolinianum - Cranesbill

FAMILY HAMMELIDACEAE

Liquidambar styraciflua - Sweetgum

FAMILY HYPERICACEAE

Hypericum hypericoides - St. Andrew's Cross

Hypericum tetrapetalum - Clasping Hypericum

FAMILY JUGLANDAEAE

Carya glabra - Pignut Hickory

FAMILY KRAMERIACEAE

FAMILY LAMIACEAE

Salvia lyrata - Lyre-Leaved Sage

Teucrium canadense - Wood Sage

Trichostema dichotomum - Forked Blue-Curls

FAMILY LENTIBULARIACEAE

Pinguicula lutea - Yellow Butterwort

Utricularia inflata - Floating Bladderwort

FAMILY LOGANIACEAE

Gelsemium sempervirens - Yellow Jessamine

Polypremum procumbens - Rustweed

FAMILY LYTHRACEAE

Lagerstroemia indica - Crape-myrtle

FAMILY MAGNOLIACEAE

Magnolia grandiflora - Southern Magnolia

FAMILY MALVACEAE

Kosteletskya virginica - Marsh Mallow

FAMILY MELASTOMATACEAE

Rhexia mariana - Pale Meadow Beauty

FAMILY MELIACEAE

Melia azedarach - Chinaberry

FAMILY MORACEAE

Morus rubra - Red Mulberry

FAMILY MYRICACEAE

Myrica cerifera - Wax Myrtle

FAMILY MYRTACEAE

Psidium guajava - Guava

FAMILY NYMPHAEACEAE

Nymphaea odorata - White Waterlilly

FAMILY NYSSACEAE

Nyssa sylvatica - Black Gum

FAMILY OLEACEAE

Fraxinus pennsylvanica - Red Ash

FAMILY ONAGRACEAE

Oenothera biennis - Biennial Evening Primrose

Oenothera lacinata - Cut-Leaved Evening Primrose

FAMILY OXALIDACEAE

Oxalis dillenii - Yellow Wood Sorrel

FAMILY PASSIFLORACEAE

Passiflora incarnata - Maypop

FAMILY PHYTOLACCACEAE

Phytolacca americana - Pokeberry

FAMILY POLGALACEAE

Polygala lutea - Wild Batchelor's Button

Polygala nana - Wild Batchelor's Button check vs. rugelii

FAMILY POLYGONACEAE

Polygonum hydropiperoides - Mild Water-Pepper (Smartweed)

Rumex hastatulus - Hastate-Leaved Dock, Sourgrass

FAMILY ROSACEAE

Crataegus flava - Summer Haw

Prunus caroliniana - Carolina Laurel Cherry

Prunus umbellata - Hog Plum

Rosa palustris - Swamp Rose

Rubus cuneifolius - Sand Blackberry

Rubus trivialis - Southern Dewberry

FAMILY RUBIACEAE

Cephalanthus occidentalis - Buttonbush

Diodia virginiana - Buttonweed

Mitchella repens - Partridge Berry

Richardia scabra - Florida Pussley

FAMILY RUTACEAE

Citrus aurantium - Sour Orange

Zanthoxylum americanum - Toothache-tree

Zanthoxylum clava-herculis - Hercule's-Club

FAMILY SALICACEAE

Salix caroliniana - Carolina Willow

FAMILY SAURURACEAE

Saururus cernuus - Lizard's-tail

FAMILY SAXIFRAGACEAE

Itea virginica - Virginia Willow

FAMILY SCROPHULARIACEAE

Agalinis purpurea - Agalinis

Bacopa caroliniana - Lemon Bacopa, Water Hyssop

Linaria canadensis - Old-field Toadflax

FAMILY SOLANACEAE

FAMILY ULMACEAE

Ulmus alata - Winged Elm

Ulmus americana - American Elm

FAMILY URTICACEAE

Boehmeria cylindrica - False Nettle

FAMILY VERBENACEAE

Callicarpa americana - American Beautyberry

Lantana camara - Shrub Verbena

Lippia nodiflora - Carpetweed (Frog-Fruit)

FAMILY VIOLACEAE

Viola esculenta - "Swamp Violet"

Viola lanceolata - Long-Leaf Violet

FAMILY VITACEAE

Parthenocissus quinquefolia - Virginia Creeper

Vitis aestivalis - Summer Grape

APPENDIX VII

Recommendations for the Management of Archaeological and Historical Resources on the Half Moon Wildlife Management Area

Recommendations for the Management of Archaeological
and Historical Resources
on the Carlton Half Moon Wildlife Management Area

(1) Former Homestead Sites. There are five recorded former homestead sites (8Sm123, 8Sm124, 8Sm125, 8Sm126, and 8Sm127) on the Carlton Half Moon WMA, some or all of which may have been associated with the former community of Alto, in existence from about 1888 through the early part of this century. Site location information has been obtained through oral history testimony, surficial scatters of historic artifacts, or remnant ornamental plants and shrubs which are known to mark homestead sites. Standing structural remains exist at only one site, the McKinney Place (8Sm125).

Management Recommendations: These sites are not considered eligible for inclusion in the National Register of Historic Places. However, GFFC management staff has agreed to avoid disturbance to these areas and to attempt to maintain them in their current condition. If disturbance is anticipated and is not avoidable, it is requested that the Florida Division of Historical Resources (DHR) be contacted prior to such activities so that monitoring or mitigation plans may be developed.

Recommendations for Future Work: GFFC is encouraged to continue gathering oral history information pertaining to the homestead sites and to regularly communicate such information to DHR. GFFC also is encouraged to support or help support a historical study of the Carlton tract, to include map and archival research and systematic oral history interviews.

GFFC and DHR (C.A.R.L. Archaeological Survey) will cooperate at some time in the future to identify the site of the Alto school in the location north of the Old Oxford Road as indicated on the sketch map included with the Florida Master Site File forms.

(2) The McKinney Place (8Sm125). The McKinney Place was inhabited between approximately 1916 and 1945, according to informant Haisley McKinney. The existing frame structure on the site, of single-story L-shaped construction with a cedar shake roof, is greatly deteriorated and is considered to be non-repairable. The place is remembered by surviving McKinneys, who gathered at the house site in the late spring of 1991 for a family reunion.

Management Recommendations: The McKinney structure does not

appear to be structurally stable and will likely collapse within the next several years. GFFC staff has agreed to not remove the existing corner pedestals of the house. By keeping the (wooden) corner blocks in place and by stabilizing them, the house location will be marked for future reference by the McKinney family and others. GFFC also has agreed to maintain the grounds in their current condition by not replanting the area or removing ornamental plants.

Recommendations for Future Work: The corner blocks of the McKinney house probably will require stabilization following the collapse of the structure to keep them from being moved or disturbed due to mowing. A simple method of protection is to drive two iron rods in the ground around each block, leaving two or three feet of rod exposed above ground.

(3) Potential Areas of Archaeological Site Location. Previous archaeological site surveys of the Withlacoochee River area (Weisman 1986, Mitchem and Weisman 1987, Weisman and Marquardt 1988) have indicated that archaeological sites in the vicinity of the Carlton tract tend to be located in areas where uplands or well-drained locations are close to or border the Withlacoochee River and around the well-drained margins of lakes, large ponds, and spring heads. It is clear that prehistoric aboriginal subsistence in this area of Florida was always strongly tied to aquatic and riverine resources. Because the environmental conditons mentioned above do not occur with any frequency on the Carlton tract, it is perhaps not too surprising that no recorded prehistoric archaeological sites are known to exist on the Carlton Half Moon WMA. Seminole War (1835-1842) maps and other military documents from the period when Seminole Indians were known to be in the area do not indicate Seminole villages in the immediate vicinity of the Carlton WMA.

Management Recommendations: GFFC staff should be aware that small unrecorded prehistoric archaeological sites may exist on remote portions of the Carlton tract, for example in the Cedar Hammock area. Because such sites, if present, are likely to be small middens (snail and mussel shell refuse) widely scattered in the swamp or floodplain areas, they most likely will be discovered by hunters or GFFC staff in the course of other work. All archaeological site locations should be reported to DHR (C.A.R.L. Archaeological Survey) at once, and plans will be made to visit and evaluate the sites.

Recommendations for Future Work: Systematic archaeological site survey of the Carlton Half Moon WMA is not recommended in the near future due to the high costs of such a survey and the relatively low probability of site discovery.

(4) The Alto Cemetery (8Sm126). The Alto cemetery contains twelve marked historic graves dating to the years between 1871-1900. In cooperation with DHR and GFFC, local resident Jake Anderson completed a maintenance and mapping project at the cemetery in February 1991 in partial fulfillment of his Eagle Scout requirements.

Management Recommendations: GFFC should patrol the cemetery regularly during high-use seasons to ensure that vandalism is not taking place. While continued maintenance of the cemetery is desirable (as a deterrent to vandalism), perhaps this best can be accomplished through cooperation with a local historical society or other civic organization.

Recommendations for Future Work: Futher historical research, as described for the homestead sites, is desirable for the Alto Cemetery.

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Brent R. Weisman/FBAR/C.A.R.L. A.S./6-3-91

APPENDIX VIII

Management procedures for cultural resources

MANAGEMENT PROCEDURES FOR ARCHAEOLOGICAL AND HISTORICAL SITES AND PROPERTIES ON STATE - OWNED OR CONTROLLED LANDS

(revised August, 1995)

A. GENERAL DISCUSSION

Archaeological and historic sites are defined collectively in 267.021(3), F.S., as "historic properties" or "historic resources". They have several essential characteristics which must be recognized in a management program.

First of all, they are a finite and non-renewable resource. Once destroyed, presently existing resources, including buildings, other structures, shipwreck remains, archaeological sites and other objects of antiquity, cannot be renewed or revived. Today, sites in the State of Florida are being destroyed by all kinds of land development, inappropriate land management practices, erosion, looting, and to a minor extent even by well-intentioned professional scientific research (e.g., archaeological excavation). Measures must be taken to ensure that some of these resources will be preserved for future study and appreciation.

Secondly, sites are unique because individually they represent the tangible remains of events which occurred at a specific time and place.

Thirdly, while sites uniquely reflect localized events, these events and the origin of particular sites are related to conditions and events in other times and places. Sites can be understood properly only in relation to their natural surroundings and the activities of inhabitants of other sites. Managers must be aware of this "systemic" character of historic and archaeological sites. Also, it should be recognized that archaeological sites are time capsules

for more than cultural history; they preserve traces of past biotic communities, climate, and other elements of the environment that may be of interest to other scientific disciplines.

Finally, the significance of sites, particularly archaeological ones, derives not only from the individual artifacts within them, but equally from the spatial arrangement of those artifacts in both horizontal and vertical planes. When archaeologists excavate, they recover, not merely objects, but also a record of the positions of these objects in relation to one another and their containing matrix (e.g., soil strata). Much information is sacrificed if the so-called "context" of archaeological objects is destroyed or not recovered, and this is what archaeologists are most concerned about when a site is threatened with destruction or damage. The artifacts themselves can be recovered even after a site is heavily disturbed, but the context - the vertical and horizontal relationships - cannot. Historic structures also contain a wealth of cultural (socio-economic) data which can be lost if historically sensitive maintenance, restoration or rehabilitation procedures are not implemented, or if they are demolished or extensively altered without appropriate documentation. Lastly, it should not be forgotten that historic structures often have associated potentially significant historic archaeological features which must be considered in land management decisions.

B. STATUTORY AUTHORITY

Chapter 253, Florida Statutes ("State Lands") directs the preparation of "single-use" or "multiple-use" land management plans for all state-owned lands and state-owned sovereignty submerged lands. In this document, 253.034(4), F.S., specifically requires that "all management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing agency plans to identify, locate, protect and preserve, or otherwise use fragile non-renewable resources, such as archaeological and historic sites, as well as other fragile resources..."

Chapter 267, Florida Statutes is the primary historic preservation authority of the state. The importance of protecting and interpreting archaeological and historic sites is recognized in 267.061(1)(a), F.S.:

> The rich and unique heritage of historic properties in this state, representing more than 10,000 years of human presence, is an important legacy to be valued and conserved for present and future generations. The destruction of these nonrenewable historic resources will engender a significant loss to the state's quality of life, economy, and cultural environment. It is therefore declared to be state policy to:
>
> 1. Provide leadership in the preservation of the state's historic resources; [and]
>
> 2. Administer state-owned or state-controlled historic resources in a spirit of stewardship and trusteeship;...

Responsibilities of the Division of Historical Resources in the Department of State pursuant to 267.061(3), F.S., include the following:

1. Cooperate with federal and state agencies, local governments, and private organizations and individuals to direct and conduct a comprehensive statewide survey of historic resources and to maintain an inventory of such responses.

2. Develop a comprehensive statewide historic preservation plan.

3. Identify and nominate eligible properties to the National Register of Historic Places and otherwise administer applications for listing properties in the National Register of Historic Places.

4. Cooperate with federal and state agencies, local governments, and organizations and individuals to ensure that historic resources are taken into consideration at all levels of planning and development.

5. Advise and assist, as appropriate, federal and state agencies and local governments in carrying out their historic preservation responsibilities and programs.

6. Carry out on behalf of the state the programs of the National Historic Preservation Act of 1966, as amended, and to establish, maintain, and administer a state historic preservation program meeting the requirements of an approved program and fulfilling the responsibilities of state historic preservation programs as provided in subsection 101(b) of that act.

7. Take such other actions necessary or appropriate to locate, acquire, protect, preserve, operate, interpret, and promote the location, acquisition, protection, preservation, operation, and interpretation of historic resources to foster an appreciation of Florida history and culture. Prior to the acquisition, preservation, interpretation, or operation of a historic property by a state agency, the Division shall be provided a reasonable opportunity to review and comment on the proposed undertaking and shall determine that there exists historic authenticity and a feasible means of providing for the preservation, interpretation and operation of such property.

8. Establish professional standards for the preservation, exclusive of acquisition, of historic resources in state ownership or control.

9. Establish guidelines for state agency responsibilities under subsection (2). Responsibilities of other state agencies of the executive branch, pursuant to 267.061(2), F.S., include:

10. Each state agency of the executive branch having direct or indirect jurisdiction over a proposed state or state-assisted undertaking shall, in accordance with state policy and prior to the approval of expenditure of any state funds on the

undertaking, consider the effect of the undertaking on any historic property that is included in, or eligible for inclusion in, the National Register of Historic Places. Each such agency shall afford the division a reasonable opportunity to comment with regard to such an undertaking.

11. Each state agency of the executive branch shall initiate measures in consultation with the division to assure that where, as a result of state action or assistance carried out by such agency, a historic property is to be demolished or substantially altered in a way which adversely affects the character, form, integrity, or other qualities which contribute to [the] historical, architectural, or archaeological value of the property, timely steps are taken to determine that no feasible and prudent alternative to the proposed demolition or alteration exists, and, where no such alternative is determined to exist, to assure that timely steps are taken either to avoid or mitigate the adverse effects, or to undertake an appropriate archaeological salvage excavation or other recovery action to document the property as it existed prior to demolition or alteration.

12. In consultation with the division [of Historical Resources], each state agency of the executive branch shall establish a program to locate, inventory, and evaluate all historic properties under the agency's ownership or control that appear to qualify for the National Register. Each such agency shall exercise caution to assure that any such historic property is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly.

13. Each state agency of the executive branch shall assume responsibility for the preservation of historic resources which are owned or controlled by such agency. Prior to acquiring, constructing, or leasing buildings for the purpose of carrying out agency responsibilities, the agency shall use, to the maximum extent feasible, historic properties available to the agency. Each agency shall undertake, consistent with preservation of such properties, the mission of the agency, and

the professional standards established pursuant to paragraph (3)(k), any preservation actions necessary to carry out the intent of this paragraph.

14. Each state agency of the executive branch, in seeking to acquire additional space through new construction or lease, shall give preference to the acquisition or use of historic properties when such acquisition or use is determined to be feasible and prudent compared with available alternatives. The acquisition or use of historic properties is considered feasible and prudent if the cost of purchase or lease, the cost of rehabilitation, remodeling, or altering the building to meet compliance standards and the agency's needs, and the projected costs of maintaining the building and providing utilities and other services is less than or equal to the same costs for available alternatives. The agency shall request the division to assist in determining if the acquisition or use of a historic property is feasible and prudent. Within 60 days after making a determination that additional space is needed, the agency shall request the division to assist in identifying buildings within the appropriate geographic area that are historic properties suitable for acquisition or lease by the agency, whether or not such properties are in need of repair, alteration, or addition.

6. Consistent with the agency's mission and authority, all state agencies of the executive branch shall carry out agency programs and projects, including those under which any state assistance is provided, in a manner which is generally sensitive to the preservation of historic properties and shall give consideration to agency programs and projects which will further the purposes of this section.

Section 267.12 authorizes the Division to establish procedures for the granting of research permits for archaeological and historic site survey or excavation on state-owned or controlled lands, while Section 267.13 establishes penalties for the conduct of such work without first obtaining written permission from the Division of Historical Resources. The

Rules of the Department of State, Division of Historical Resources, for research permits for archaeological sites of significance are contained in Chapter 1A-32, F.A.C.

Another Florida Statute affecting land management decisions is Chapter 872, F.S. Section 872.02, F.S., pertains to marked grave sites, regardless of age. Many state-owned properties contain old family and other cemeteries with tombstones, crypts, etc. Section 872.05, F.S., pertains to unmarked human burial sites, including prehistoric and historic Indian burial sites. Unauthorized disturbance of both marked and unmarked human burial sites is a felony.

C. MANAGEMENT POLICY

The choice of a management policy for archaeological and historic sites within state-owned or controlled lands obviously depends upon a detailed evaluation of the characteristics and conditions of the individual sites and groups of sites within those tracts. This includes an interpretation of the significance (or potential significance) of these sites, in terms of social and political factors, as well as environmental factors. Furthermore, for historic structures architectural significance must be considered, as well as any associated historic landscapes.

Sites on privately owned lands are especially vulnerable to destruction, since often times the economic incentives for preservation are low compared to other uses of the land areas involved. Hence, sites in public ownership have a magnified importance, since they are the ones with the best chance of survival over the long run. This is particularly true of sites which are state-owned or controlled, where the basis of management is to provide for land uses that are minimally destructive of resource values.

It should be noted that while many archaeological and historical sites are already recorded within state-owned or controlled-lands, the majority of the uplands areas and nearly all of the inundated areas have not been surveyed to locate and assess the significance of such resources. The known sites are, thus, only an incomplete sample of the actual resources - i.e., the number, density, distribution, age, character and condition

of archaeological and historic sites - on these tracts. Unfortunately, the lack of specific knowledge of the actual resources prevents formulation of any sort of detailed management or use plan involving decisions about the relative historic value of individual sites. For this reason, a generalized policy of conservation is recommended until the resources have been better addressed.

The generalized management policy recommended by the Division of Historical Resources includes the following:

1. State land managers shall coordinate all planned activities involving known archaeological or historic sites or potential site areas closely with the Division of Historical Resources in order to prevent any kind of disturbance to significant archaeological or historic sites that may exist on the tract. Under 267.061(1)(b), F.S., the Division of Historical Resources is vested with title to archaeological and historic resources abandoned on state lands and is responsible for administration and protection of such resources. The Division will cooperate with the land manager in the management of these resources. Furthermore, provisions of 267.061(2) and 267.13, F.S., combined with those in 267.061(3) and 253.034(4), F.S., require that other managing (or permitting) agencies coordinate their plans with the Division of Historical Resources at a sufficiently early stage to preclude inadvertent damage or destruction to known or potentially occurring, presently unknown archaeological and historic sites. The provisions pertaining to human burial sites must also be followed by state land managers when such remains are known or suspected to be present (see 872.02 and 872.05, F.S., and 1A-44, F.A.C.)

2. Since the actual resources are so poorly known, the potential impact of the managing agency's activities on historic archaeological sites may not be immediately apparent. Special field survey for such sites may be required to identify the potential endangerment as a result of particular management or

permitting activities. The Division may perform surveys, as its resources permit, to aid the planning of other state agencies in their management activities, but outside archaeological consultants may have to be retained by the managing agency. This would be especially necessary in the cases of activities contemplating ground disturbance over large areas and unexpected occurrences. It should be noted, however, that in most instances Division staff's knowledge of known and expected site distribution is such that actual field surveys may not be necessary, and the project may be reviewed by submitting a project location map (preferably a 7.5 minute U.S.G.S. Quadrangle map or portion thereof) and project descriptive data, including detailed construction plans. To avoid delays, Division staff should be contacted to discuss specific project documentation review needs

3. In the case of known significant sites, which may be affected by proposed project activities, the managing agency will generally be expected to alter proposed management or development plans, as necessary, or else make special provisions to minimize or mitigate damage to such sites.

4. If in the course of management activities, or as a result of development or the permitting of dredge activities (see 403.918(2)(6)a, F.S.), it is determined that valuable historic or archaeological sites will be damaged or destroyed, the Division reserves the right, pursuant to 267.061(1)(b), F.S., to require salvage measures to mitigate the destructive impact of such activities to such sites. Such salvage measures would be accomplished before the Division would grant permission for destruction of the affected site areas. The funding needed to implement salvage measures would be the responsibility of the managing agency planning the site destructive activity. Mitigation of historic structures at a minimum involves the preparation of measured drawings and documentary photographs. Mitigation of archaeological resources involves the excavation, analysis and reporting of the project findings and must be planned to occur sufficiently in advance to avoid project construction delays. If these services are

to be contracted by the state agency, the selected consultant will need to obtain an Archaeological Research Permit from the Division of Historical Resources, Bureau of Archaeological Research (see 267.12, F.S. and Rules 1A-32 and 1A-46 F.A.C.).

5. For the near future, excavation of non-endangered (i.e., sites not being lost to erosion or development) archaeological sites is discouraged. There are many endangered sites in Florida (on both private and public lands) in need of excavation because of the threat of development or other factors. Those within state-owned or controlled lands should be left undisturbed for the present - with particular attention devoted to preventing site looting by "treasure hunters". On the other hand, the archaeological and historic survey of these tracts is encouraged in order to build an inventory of the resources present, and to assess their scientific research potential and historic or architectural significance.

6. The cooperation of land managers in reporting sites to the Division that their field personnel may discover is encouraged. The Division will help inform field personnel from other resource managing agencies about the characteristics and appearance of sites. The Division has initiated a cultural resource management training program to help accomplish this. Upon request the Division will also provide to other agencies archaeological and historical summaries of the known and potentially occurring resources so that information may be incorporated into management plans and public awareness programs (See Management Implementation).

7. Any discovery of instances of looting or unauthorized destruction of sites must be reported to the agent for the Board of Trustees of the Internal Improvement Trust Fund and the Division so that appropriate action may be initiated. When human burial sites are involved, the provisions of 872.02 and 872.05, F. S. and Rule 1A-44, F.A.C., as applicable, must also be followed. Any state agent with

law enforcement authority observing individuals or groups clearly and incontrovertibly vandalizing, looting or destroying archaeological or historic sites within state-owned or controlled lands without demonstrable permission from the Division will make arrests and detain those individuals or groups under the provisions of 267.13, 901.15, and 901.21, F.S., and related statutory authority pertaining to such illegal activities on state-owned or controlled lands. County Sheriffs' officers are urged to assist in efforts to stop and/or prevent site looting and destruction.

In addition to the above management policy for archaeological and historic sites on state-owned land, special attention shall be given to those properties listed in the National Register of Historic Places and other significant buildings. The Division recommends that the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (Revised 1990) be followed for such sites.

The following general standards apply to all treatments undertaken on historically significant properties.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alterations of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired. (see Secretary

of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings [Revised 1990]).

Division of Historical Resources staff are available for technical assistance for any of the above listed topics. It is encouraged that such assistance be sought as early as possible in the project planning.

D. MANAGEMENT IMPLEMENTATION

As noted earlier, 253.034(4), F.S., states that "all management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing agency plans to identify, locate, protect and preserve, or otherwise use fragile non-renewable resources, such as archaeological and historic sites..." The following guidelines should help to fulfill that requirement.

1. All land managing agencies should contact the Division and send U.S.G.S. 7.5 minute quadrangle maps outlining the boundaries of their various properties.

2. The Division will in turn identify site locations on those maps and provide descriptions for known archaeological and historical sites to the managing agency.

3. Further, the Division may also identify on the maps areas of high archaeological and historic site location probability within the subject tract. These are only probability zones, and sites may be found outside of these areas. Therefore, actual ground inspections of project areas may still be necessary.

4. The Division will send archaeological field recording forms and historic structure field recording forms to representatives of the agency to facilitate the recording of information on such resources.

5. Land managers will update information on recorded sites and properties.

6. Land managers will supply the Division with new information as it becomes available on previously unrecorded sites that their staff locate. The following details the kind of information the Division wishes to obtain for any new sites or structures which the land managers may report:

A. Historic Sites

(1) Type of structure (dwelling, church, factory, etc.).

(2) Known or estimated age or construction date for each structure and addition.

(3) Location of building (identify location on a map of the property, and building placement, i.e., detached, row, etc.).

(4) General Characteristics: (include photographs if possible) overall shape of plan (rectangle, "L" "T" "H" "U", etc.); number of stories; number of vertical divisions of bays; construction materials (brick, frame, stone, etc.); wall finish (kind of bond, coursing, shingle, etc.); roof shape.

(5) Specific features including location, number and appearance of:
(a) Important decorative elements;
(b) Interior features contributing to the character of the building;
(c) Number, type, and location of outbuildings, as well as date(s) of construction;
(d) Notation if property has been moved;

(e) Notation of known alterations to building.

B. Archaeological Sites

(1) Site location (written narrative and mapped location).

(2) Cultural affiliation and period.

(3) Site type (midden, burial mound, artifact scatter, building rubble, etc.).

(4) Threats to site (deterioration, vandalism, etc.).

(5) Site size (acreage, square meters, etc.).

(6) Artifacts observed on ground surface (pottery, bone, glass, etc.).

(7) Description of surrounding environment.

7. No land disturbing activities should be undertaken in areas of known archaeological or historic sites or areas of high site probability without prior review by the Division early in the project planning.

8. Ground disturbing activities may proceed elsewhere but land managers should stop disturbance in the immediate vicinity of artifact finds and notify the Division if previously unknown archaeological or historic remains are uncovered. The provisions of Chapter 872, F.S., must be followed when human remains are encountered.

9. Excavation and collection of archaeological and historic sites on state lands without a permit from the Division is a violation of state law and shall be reported to a law enforcement officer. The use of metal detectors to search for historic artifacts shall be prohibited on state lands except when authorized in a 1A-32, F.A.C., research permit from the Division.

10. Interpretation and visitation which will increase public understanding and enjoyment of archaeological and historic sites without site destruction or vandalism is strongly encouraged.

11. Development of interpretive programs including trails, signage, kiosks, and exhibits is encouraged and should be coordinated with the Division.

12. Artifacts found or collected on state lands are by law the property of the Division. Land managers shall contact the Division whenever such material is found so that arrangements may be made for recording and conservation. This material, if taken to Tallahassee, can be returned for public display on a long term loan.

E. ADMINISTERING AGENCY

Questions relating to the treatment of archaeological and historic resources on state lands may be directed to:

Compliance Review Section
Bureau of Historic Preservation
Division of Historical Resources
R.A. Gray Building

500 South Bronough Street
Tallahassee, Florida 32399-0250

Contact Person: Susan M. Harp
Historic Preservation Planner

Telephone (904) 487-2333
Suncom 277-2333
FAX (904) 922-0496

APPENDIX IX

Prescribed Burning Plan

PRESCRIBED BURNING PLAN

for

HALF MOON WILDLIFE MANAGEMENT AREA

Prepared by:

William O. Sermons, Jr. and Stephen L. Jester

Florida Fish and Wildlife Conservation Commission

April, 1992

I. INTRODUCTION

A. General Background. Fire has shaped the very physiognomy of Earth and influenced creation and evolution of its biota since the planet's genesis. Benthic samples recount fires occurring in ancient forests, perhaps 10 million years ago (Komarek 1976a). Fire formed the foundation of man's civilization (Komarek 1976b) and likely continues as the single most important factor in determining what biota occur in many areas (Stoddard 1931).

Few single or collective communities are as fire-dependent and pyrogenic as those of the southeastern U.S. Shantz (1947) estimated that one-third of the natural vegetation of earth's land surface has been affected by fire. However, in southeastern Georgia, Eldridge (1935) observed that 85% of land under forests of all types and 91% occupied by pines displayed evidence of fire history.

Anthropogenic fire use in the New World can trace it origins to the arrival of Indians in North America, 10,000-20,000 years ago. Native Americans used fire to clear woodlands for agriculture, pursue game, reduce densities of parasitic insects (Greene 1931), and as a means of communication (Swanton 1946). Early European settlers recognized the utility of fire toward manipulating their environment and adopted woodland burning practices of Indians. With exhaustive clear-cutting of southeastern pine forests in the early twentieth century, an acute need for roundwood regeneration, and growing public disdain for open burning, fire suppression pervaded the increasingly industrialized region (Pyne 1982). Widespread use of fire in

woodlands slowly reemerged several decades later as prescribed burning. In 1942, the Florida Forest Service implemented a policy permitting the use of fire to eradicate heavy accumulations of understory growth in pine plantations, provided no more than one-half of the crown would be scorched.

Since that time, fire has been refined and utilized increasingly as a management tool by resource managers to improve forest regeneration and maintenance, and to improve wildlife habitat, cattle range, and aesthetics (Wade and Lunsford 1989). Today, however, new

challenges confront resource managers. Social attitudes, habitat fragmentation, species isolation, deteriorating air quality, and the effects of anthropogenic carbon dioxide concentrations on flora and community productivity necessitate innovative approaches to management, especially prescribed burning, of natural communities.

B. Goals. The primary objective of prescribed burning on Half Moon Wildlife Management Area is to apply fire in a carefully organized manner, using a team approach to develop efficacious prescriptions, so that predetermined goals are safely and effectively met for each burn unit. Principal integrated goals are as follows:

1. Restoration and Maintenance of Natural Communities. Excepting public use facilities, wildlife openings, and historic sites, to restore altered landscapes to heterogeneous semblances of pre-settlement communities; to maintain the general physiognomy and composition of extant natural communities;

2. Maintenance and Restoration of Florida Scrub Jay Habitat. To maintain the physical structure, spatial distribution, and composition of occupied habitat for Florida scrub-jays (Aphelocoma coerulescens); to restore altered, former habitats to conditions suitable for occupancy by jays; and,

3. Augmentation of Heterogeneity Within and Among Community Types. To maintain or increase plant-species and foliage-height diversity, within and among specific associations of native communities by varying fire regimes within and among those types; to similarly increase diversity of fauna by bolstering microspatial heterogeneity.

Concomitant goals include:

4. Control of Exotic Flora. To eradicate or control abundance and distribution of fire-intolerant exotic vegetation; and,

5. Fuel Hazard Reduction. To diminish the probability and spread of wildfire;

II. DESCRIPTION OF AREA

A. Acquisition.

The Conservation and Recreation Lands (CARL) Trust Fund was established in 1979 to facilitate public acquisition of environmentally endangered lands and other lands of public interest in Florida. Those properties not qualifying for purchase as environmentally endangered lands could be acquired for protecting local water resources, utilization as public recreational areas, restoration of altered ecosystems, and preservation of archaeological and historical sites.

The Carlton Half Moon Ranch project qualified for purchase by the State under "other lands" criteria of the CARL program. On August 15, 1989, W. Albert and Barbara C. Carlton conveyed title to Carlton Half Moon Ranch to the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida.

The 4458 acre tract, now commonly referred to as Half Moon Wildlife Management Area (HMWMA), was the largest singular acquisition of the 11,500 acre project. Primary objective of the purchase was to preserve water quality of the Withlacoochee River, Gum Slough, and their proximal tributaries; collaterally for establishment as a wildlife management area. Three project additions, totalling 1017 acres, pend forthcoming closure.

B. Location.

HMWMA lies near Rutland in northwestern Sumter County, approximately 25 miles south-southwest of Ocala (Figure 1). Public access is available from County Road 247, off State Road 44, about 7 miles west of Interstate 75 and the Florida Turnpike.

C. Physiography.

1. Topography. Straddling the north-south trending Tsala Apopka Plain and Western Valley physiographic provinces, topography of HMWMA is comparatively flat. Conspicuous relief occurs only near margins of paludal depressions and crests of widely dispersed, relic dunes. Land surface altitudes range from 40 to 60 feet above mean sea level and increase generally from the Tsala Apopka Plain in the west to the Western Valley in the east.

2. Geology. Surface geology of HMWMA is characterized by a thick sequence of Cretaceous and Tertiary carbonate deposits discontinuously overlaid by a thin, intermixed series of Penholoway Terrace sediments; mostly unconsolidated sand and clay, deposited during

interglacial periods of Oligocene to Recent Epochs (Healy 1975). Surface features are dominated by the Ocala Group, a fine-grained, fossiliferous limestone deposited during the upper Eocene (White 1970). Three units in descending order, the Crystal River Formation**,** Williston Formation, and Inglis Formation, comprise the Ocala Group. All generally consist of foraminiferal limestone, but chert layers may occur throughout the Group. In addition, the Inglis Formation often contains dolomite. Avon Park Formation, a thick limestone and dolomite deposit of middle Eocene origin, underlies the relatively shallow Ocala Limestone.

3. Soils. Crystal River and Lower Ocala Group limestone formations give rise to 68 soil types in Sumter County, 23 of which, representing 7 soil orders, occur on HMWMA (Yamataki et al. 1988). The majority of soil on the area can be placed into 1 of the 4 following series.

> Gator Muck - a wetland series formed by decomposition of hydrophytic plants and underlain by beds of loamy and sandy marine sediment; 55-85% organic; pH 6.1-8.4 (at 25 inches); permeability: 6 inches/20 hours; available water capacity: .30 inches of water/.40 inches of soil;
>
> EauGallie fine sand - poorly drained, mineral soil; organic matter 1-4%; water permeability: 6 inches/20 hours; water capacity: .03 inches/.08 inches of soil;
>
> Vero sands (depressional and bouldery) - nearly level, poorly drained mineral soil; pH 5.6-8.4; available water capacity: .10 inches/.15 inches of soil;
>
> Sparr fine sand - nearly level to gently sloping and somewhat poorly drained; organic matter <3%; permeability: 6 inches/20 hours; water capacity: .05 inches/.08 inches of soil.

4. Climate. The climate of Sumter County is characterized as subtropical with long, warm, and relatively humid summers and dry, mild winters. About 56% of the annual precipitation occurs from June through September in the form of intense late afternoon thunderstorms which develop as a result of convective land air masses mixing with cool, encroaching sea breezes. Winter and spring precipitation generally result from less intense, longer lasting continental frontal systems.

Data collected at the Southwest Florida Water Management District weather station in Inverness, Florida, 9 miles west of HMWMA, indicate that an average of 53.1 inches of rain have fallen annually over the last 20 years. Average monthly precipitation levels over the last 20 years have been highest during June, July and August with 7.4, 7.5 and 7.7 inches of rainfall, respectively, being recorded. In contrast, rainfall of November, December, January and February averaged 1.9, 2.5, 2.6 and 2.9 inches, respectively.

Summer temperatures regularly exceed 90° F, especially during July and August which are the two hottest months of the year. Winter temperatures can vary widely, but usually average 50° F to 60° F from December through February. Sub-freezing temperatures, greater than 20° F, can be expected once each winter.

D. Vegetation.

Vegetation patterns on HMWMA are characterized generally by a diverse mosaic of freshwater wetlands closely interspersed among flatwoods, hammocks, and ruderal sites, primarily improved pastures. Wetlands comprise approximately 40 percent of the total area. From interpretation of 1972-73 aerial photographs, the Florida Natural Area Inventory (FNAI) listed occurrences of floodplain swamp, floodplain forest, hydric hammock, prairie hammock, basin marsh, basin swamp, and mesic flatwoods within the project planning boundary. The FNAI lists no element occurrences (i.e., "single extant habitat which sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element") for the area (Memorandum - Dec. 21, 1985, Appendix A).

Human influences during the last 50 years have greatly altered and reshaped the landscape. Major alterations have included ditching/draining of wetlands, pasture development, cultivation of row crops, continuous grazing, selective logging, and exploitation of gum and wood navel stores.

Important natural and altered communities are listed below. Taxonomic nomenclature follows Wunderlin (1982) and Godfrey (1988).

1. Flatwoods. Flatwoods communities dominate the physiognomy of non-ruderal upland portions of HMWMA and are represented by mesic and scrubby flatwoods associations. Areal coverage of flatwoods, especially scrubby flatwoods, has been reduced greatly by conversion to and maintenance of exotic pasture grasses.

The associations' species composition and structure vary markedly along subtle elevation, moisture, and edaphic gradients; typically, occurring as continua of hydric or mesic flatwoods near palustrine ecotones to scrubby flatwoods on sufficiently-drained uplands.

Stratigraphy of the scrubby flatwoods association is characterized by a sparse, open-structured overstory of longleaf pine (Pinus palustris), subtended by a moderately dense understory of saw palmetto and clumpily distributed patches of xerophytic oaks. Ground cover is dominated by rhizomatous woody vegetation, but includes mixed ephemeral forbs, and perennial grasses interspersed among small, widely scattered areas of bare soil.

Gross stratigraphy of mesic flatwoods stands differs only slightly from that of scrubby flatwoods associations on the area. However, floral composition and site-specific fidelity vary strikingly, especially among woody understory species. Slash (P. elliottii) and loblolly (P. taeda) pines dominate overstory strata of more poorly drained flatwoods sites. Dominance or co-dominance of loblolly pines in selected stands may largely reflect previous commercial "high-grading" of pinelands and soil disturbances.

2. Sandhill. Vestiges of sandhill vegetation persist sparingly over northwestern portions of HMWMA and are largely confined to moderately well-drained, higher elevations. Although most sites have been cleared for agriculture, the community probably occupied fewer than 150 acres before alteration by previous landowners.

Only one natural stand of sandhill pineland, measuring approximately 15 acres, remains on the area. Stratigraphy and composition of the stand are characterized by a thinly-stocked overstory of longleaf pine, subtended by a distinct midstory stratum of scattered turkey (Quercus laevis) and sand post (Q. margaretta)

oaks, interspersed among comparatively dense stands of bluejack oaks (Quercus incana). Understory strata are represented by a mixture of grasses, forbs, and shrubs. Common flora include threeawns (Aristida spp.), lopsided indiangrass (Sorghastrum secundum), gopher apple (Licania michauxii), tread softly (Cnidoscolus stimulosus), shiny blueberry (Vaccinium myrsinites), and assorted legumes (Fabaceae). Empirical data suggest selected xeric hammocks and portions of some pastures may have occurred historically as sandhill pineland.

3. Ruderal Sites. Ruderal vegetation occupies nearly 50 percent (approx. 1200 ac.) of all uplands on HMWMA. Excepting early homesites, schools, cemeteries, and their immediate environs, most sites were cleared since 1940 and planted previously to row crops or pasture grasses. Bahiagrass (Paspalum notatum) dominates most sites, however, pangola grass prevails on scattered well-drained sites. Other planted grasses include alicia and hemarthia.

Pines, oaks, and cabbage palmettos (Sabal palmetto) are widely scattered throughout pastures. However, a well-defined, dense upper stratum is absent. Flora are generally restricted to subordinate strata comprised principally of mixed forbs, grasses, and woody shrubs that demonstrate no definitive affinity for any natural community. Human occupancy and use of the area have introduced directly or allowed encroachment of numerous exotic or naturalized flora.

Edaphic features, topography, observations of relict vegetation, and historical accounts of vegetation patterns suggest most ruderal sites were occupied by mesic and scrubby flatwoods prior to widespread clearing for cultivation and pasturage. Without continued frequent maintenance (e.g., grazing, mowing, burning, fertilization) some pastures, especially those planted to species other than bahiagrass, are reverting to components of previous natural communities. Exclusion of fire and mowing since winter 1989 and grazing since February 1990, have increased coverage of selected woody plants in comparatively recently cleared

pastures. Others, particularly those cleared and cultivated, contain few natural community remnants and pose a dilemma to community restoration.

4. Xeric Hammock. Xeric hammocks are spottily distributed; most prevalent at higher elevations (i.e., 55 - 60 ft. above msl) in northern sections of the area. Historically, portions of these sites probably supported sandhill floral associates (e.g., longleaf pine/turkey oak), but apparently were attractive homestead sites and have been altered by previous human and livestock uses. Long-term grazing, trampling, and compaction by cattle and fire exclusion have eliminated much of the understrata. In some stands, relict sandhill flora persist in the mid- and overstories. However, most has been replaced by xero- and mesophytic hardwoods.

5. Mesic Hammock. Mesic hammocks occur widely over HMWMA and are generally associated with paludal or stream margins and surficial deposits or outcroppings of limestone. Portions of some stands may flood briefly or their substrates remain saturated for extended periods during the growing season. Areal coverage, relative juxtaposition, and spatial heterogeneity facilitate partitioning of faunal niches; likely supporting high species richness.

6. Wetlands. A diverse assemblage of riverine, palustrine, and lacustrine systems, including forested, emergent, aquatic bed, shrub, and unconsolidated bottom classes, with widely varying hydroperiods, occurs throughout the area, covering approximately 1870 acres (United States Department of Interior 1988). This areal array of wetland systems contributes significantly to overall floral diversity, heterogeneity of habitat types, and associated fauna.

Generally, wetlands on the area are products of upwellings of ground water resulting from seepage from the water-table aquifer into depressions. However, Mill Creek, a riverine wetland system, arises from a spring of the Floridan aquifer.

Wetland types on HMWMA and their acreage, as measured from National Wetlands Inventory quadrangles (Lake Panasoffkee NW, Stokes Ferry, and Rutland - 1988), based on stereoscopic analyses of high altitude aerial photographs (Jan. 1984), are as follows*:

System: Lacustrine . . . . . 109 acres
Subsystem: Littoral
Class: Aquatic bed
Subclass: Rooted vascular
Water Regime: Permanently flooded

System: Palustrine 1761
Subsystem: Not applicable
Class: Forested 855
Subclass: Broad-leaved deciduous (BLD) . . 378
Water Regime: Seasonally flooded . . . 289
Water Regime: Temporarily flooded . . . 88
Subclass: Needle-leaved deciduous (NLD). . 351
Water Regime: Semipermanently flooded
Subclass: NLD/Broad-leaved evergreen (BLE). .2
Water Regime: Semipermanently flooded
Subclass: BLE/BLD 3
Water Regime: Seasonally flooded
Subclass: Deciduous 122
Water Regime: Semipermanently flooded . 25
Water Regime: Seasonally flooded . . . 97
Class: Scrub-Shrub 61
Subclass: Deciduous 7
Water Regime: Semipermanently flooded
Subclass: BLD 53
Water Regime: Semipermanently flooded . 51
Water Regime: Intermittently exposed. . 2
Class: Aquatic Bed 570
Subclass: Floating Vascular 2
Water Regime: Permanently flooded
Subclass: Rooted Vascular 568
Water Regime: Permanently flooded
Class: Emergent 330
Subclass: Persistent
Water Regime: Temporarily flooded . . . 9
Water Regime: Intermittently flooded . 199
Water Regime: Seasonally flooded . . . 6
Water Regime: Semipermanently flooded .111
Water Regime: Semipermanently flooded . .5
Special Modifier: Partially drained/ditched
Class: Unconsolidated Bottom 54
Subclass: Not applicable

Water Regime: Permanently flooded . . . 52
Water Regime: Permanently flooded . . . 2
Special Modifier: Excavated

* Classification of wetlands follows Cowardin et al. (1979).

Vegetation composition and structure of area wetlands are shaped by and often products of a host of influences including hydroperiods, edaphic characteristics, water chemistry, topography, fire, and anthropogenic alterations. Individual wetlands, especially lacustrine and larger palustrine systems, may contain several distinct wetland classes, subclasses, and modifiers, each with characteristic flora.

Some of the common species listed by wetland class are: Emergent - maidencane (Panicum hemitomon), saw grass (Cladium jamaicense), sand cordgrass (Spartina bakeri) and pickerelweed (Pontederia cordata); Aquatic Bed - white waterlilly (Nymphaea odorata), marsh pennywort (Hydrocotyle umbellata) and duckweed (Lemna spp.); Scrub-shrub - wax myrtle (Myrica cerifera), fetterbush (Lyonia lucida), red chokeberry (Aronia arbutifolia) and Carolina willow (Salix caroliniana); Forested - bald cypress (Taxodium distichum), ironwood (Carpinus caroliniana), live oak (Quercus virginiana), red maple (Acer rubrum), and black gum (Nyssa sylvatica).

Human impacts to wetlands are apparent throughout the area. Over 2 miles of ditches have been excavated to facilitate drainage of lacustrine and larger palustrine systems. Portions of at least 15 palustrine wetlands were excavated to provide permanent sources of surface water for cattle. All forested wetlands have been logged. Until February 1990, essentially all wetlands were continuously grazed; deferred only by the periodicity of high water and relative abundance of ectoparasitic arthropods.

E. Fire Management History. Essentially all natural communities on the area are fire-based, dependent largely on periodic, yet irregular, disturbances for maintenance of biological diversity and relative stability. Evidence of previous fires conspicuously pervades all community types and stands except the interiors of some larger, forested wetlands. However, fire management history of the area is largely unknown. Recent, previous owners and managers

periodically burned pastures, flatwoods, and emergent wetlands during winter to improve cattle forage. Scrubby flatwoods were burned on average "every several years during winter to reduce scrub oaks" (J. Taylor - pers. comm.).

III. PROPOSED BURNING PROGRAM

A. General. Restoration of a pre-Columbian landscape is impractical and, perhaps, impossible on Half Moon WMA due to the area's comparatively small size and its history of anthropogenic alterations. In addition, accounts of pre-settlement communities are vaguely descriptive and based largely on general inferences from post-settlement communities; thus, precluding measurable replication. Nevertheless, some attributes of former communities can probably be restored by mimicking natural fire regimes under present environmental conditions.

To achieve broad goals of ecological restoration and maintenance of community heterogeneity, no singular or fixed fire regime will be applied across communities or their associations. Instead, fire frequency, its intensity, season of application, pattern of spread, and regularity will be varied widely among and within burn units.

One possible exception to this, however, is management of scrub jay habitat. Maintenance of suitable structure and composition of habitat, while avoiding disruption of jay recruitment are paramount objectives in stands occupied by scrub-jays.

Approximately 16 jay groups, a portion of the largest and one of the few remaining populations in Sumter County, occur on HMWMA. Present population size, increasing insularity, and eventual isolation from other populations necessitate intensive management.

Although scrub jay management objectives can probably be accomplished collaterally with other goals, deviations from ecological prescriptions may be necessary occasionally. Specific instances are discussed below.

HMWMA has been divided into 4 burn zones for simplification and to facilitate planning of objectives for individual burn units. The zones are Mill Creek South (MCS), Mill Creek North 1 (MCN1), Mill Creek North 2 (MCN2), and Mill Creek North 3 (MCN3) (Figure 2).

B. Firelines. Approximately 16.7 miles of perimeter firelines, measuring 15 feet wide, were developed or re-established during late spring 1991 to facilitate fire control. Perimeter firebreaks, separating stands adapted to frequent fire, will require annual maintenance, generally discing, to exclude wildfire and contain prescribed fire. Forested and riverine wetlands will provide natural extinguishment along approximately 5 miles of area boundary. Fewer than 10 miles of disced perimeter firebreaks will be needed if burn units are consolidated with those on the adjacent tract managed by Southwest Florida Water Management District. See Appendix B correspondence for proposals to consolidate conterminous burn units.

All interior firebreaks requiring treatment are scheduled to be developed during FYs 91-92 and 92-93. Their proposed placement (Figure 1) is the result of an effort to utilize natural firebreaks, existing firelines, public use roads and other previously disturbed sites, especially bahiagrass pastures. Linear distances and placements of prospective interior firelines are included in Table 1. These estimates assume that the State of Florida will acquire the Potter parcels as planned. If not, approximately 1 mile of additional fireline must be established through flatwoods. As yet, no proposed firelines have been routed through communities that have not been disturbed recently or altered significantly. Pre-existing firebreaks (e.g., roads, perimeter firelines) comprise nearly 90 percent of all proposed artificial firebreaks. The remainder will be established in

Table 1. Mileage breakdown, by zone, of proposed fireline locations on Half Moon WMA, Sumter County, Florida.

	Located On:			
Zone	Ruderal Sites	Existing Firelines & Old Roads	Perimeter & Mill Creek Rd.	Total
MCS	1.7 mi.	1.1 mi.	7.4 mi.	10.2 mi.
MCN1	1.8 mi.	5.0 mi.	5.3 mi.	12.1 mi.
MCN2	0.4 mi.	3.9 mi.	3.8 mi.	8.1 mi.
MCN3	0.5 mi.	1.3 mi.	6.1 mi.	7.9 mi.
Total	4.4 mi.	11.3 mi.	22.6 mi.	38.3 mi.

Overall percentage breakdowns for fireline locations are as follows: 11.5% of firelines are located in ruderal sites; 29.5% are located in old road beds and existing firelines; and 59.0% are located on perimeter and Mill Creek Rd.

ruderal sites and aligned so as to largely avoid existing natural ecotones. Further, natural firebreaks such as ponds, swamps and hydric hammocks will be used for fire containment when possible.

The use of black lines as an artificial means of fire containment will be explored when burning units containing communal arrays, particularly those adapted to widely differing fire frequencies. However, their use in large continuous stands of scrubby flatwoods jeopardizes safety. Area fuel types preclude use of black lines as a sole source of fire containment in most units, but black lines may serve to widen existing firebreaks on units bounded by fine fuels.

All firelines requiring soil disturbance will receive final treatment with a tractor and offset disc. This will allow for removal of vegetation while retaining soil in its initial location, and therefore, should not impact pre-treatment rates of water flow or direction. Further, disced, interior firelines will be allowed to revegetate in order to help stabilize the soil during times when burning activities are not being implemented. Perimeter firelines abutting scrubby flatwoods may require pre-burn widening by mowing or roller-chopping to reduce spot-over hazard and liability.

C. Size and Arrangement of Compartments. An estimated total of 3,500 acres of fire-facilitating communities exists on HMWMA. However, this figure may differ within and among years with changes in weather, hydroperiods, fuel accumulations, and other associated factors. A total of 37 burn units, averaging 102 (R:20-276) acres, will be developed and used initially (Figure 3, Table 2). Fire will be excluded from one former, pyric-adapted tract, measuring 12 acres, to avoid damage to the McKinney homesite and environs (DHR Master Site File: Site 8-SM125).

Configurations and minimum sizes of burn units are limited largely by the availability of natural (e.g., forested wetlands) and pre-existing (e.g., road networks) firebreaks, but tempered by efficiency demands and general goals of ecological restoration. Average size and upper limits reflect mitigating constraints imposed by stringent smoke management statutes and safety guidelines. Indeed, larger proposed units, encompassing scrubby flatwoods, will challenge area managers when developing and safely implementing ecological burn prescriptions. Erratic fire behavior and unpredictable weather changes will necessitate use of exacting, perhaps

unrealistic, prescriptions (e.g., narrow acceptable wind directions) when burning larger units during the growing season.

Table 2. Acreage of proposed burn units on Half Moon WMA, Sumter County, Florida.

Unit	Zone	Acreage
1	MCS	116
2	MCS	32
3	MCS	71
4	MCS	28
5	MCS	62
6	MCS	106
7	MCS	199
8	MCS	85
9	MCS	159
1	MCN1	20
2	MCN1	54
3	MCN1	135
4	MCN1	189
5	MCN1	96
6	MCN1	35
7	MCN1	71
8	MCN1	60
9	MCN1	111
10	MCN1	276
11	MCN1	265
1	MCN2	49
2	MCN2	20
3	MCN2	140
4	MCN2	105
5	MCN2	79
6	MCN2	187
7	MCN2	123
8	MCN2	84
1	MCN3	170
2	MCN3	134
3	MCN3	79
4	MCN3	172
5	MCN3	46
6	MCN3	84
7	MCN3	62
8	MCN3	28
9	MCN3	30

Maximum sizes of approximately one-half of all proposed units are limited by abutment with property boundaries and public use roads. Consolidation of these units with adjacent ones would confer no appreciable ecological benefit, as marginal, "artificial" ecotones would persist. Instead, overall heterogeneity would likely diminish if presently arranged units are consolidated with adjacent units.

Burn unit sizes were restricted further by management needs and habitat requirements of scrub-jays. Where possible, unit configurations were designed to bisect jay territories so as to ensure continual access and availability of suitable post-burn foraging habitat, nest sites, and escape cover. Because several territories overlap adjacent properties, this was accomplished largely by perimeter firelines alone.

Despite this, the opportunity exists to increase sizes of several peripheral units that bound Southwest Florida Water Management District by consolidating those units with the District's and burning into natural firebreaks. The ecological benefit to area resources and the economic benefit to FWC and the District are obvious.

D. Burning Schedule. Following initial fuel hazard reduction burns, all units will be burned using irregular fire return intervals, within adapted ranges, for each association or community type. Each unit will be classified broadly as scrubby flatwoods, mesic/hydric flatwoods, or sandhill, according to the predominate natural association or group of relics within its uplands. Wetlands will burn in conjunction with fire application to more pyrogenic surrounding communities. Areal coverage and composition of other extant associations (e.g., xeric hammock) will be ensured by periodic, lengthy fire return intervals in all community types.

However, simulating all possible natural fire regimes, especially their fire frequencies, exceeds the scope and capability of any land management plan or program. Undoubtedly intervals between successive fires were exceptionally long on occasion. Such supernormal intervals of fire return pose liability and safety risks and may damage natural communities. Hence, they will not be used on HMWMA.

Fire return intervals will be selected randomly for each burn unit from weighted, community-specific ranges of fire frequencies (Table 3). Hydric/mesic flatwoods units will be burned every 1 to 10 years with individual years 3 to 5 having twice the probability of selection over other individual years. Similarly, prescribed fire will be applied to sandhill units every 1 to 10 years. However, years 2 to 3 have twice the selection probabilities as years 1 and 6 to 10, but only one-half that of years 4 to 5. Scrubby flatwoods units will be burned between 6 to 15 years with 2X selection probability during years 9 to 11.

Table 3. Selection probabilities for fire return intervals by community type on Half Moon WMA, Sumter County, Florida.

Fire Return Interval	Community Type		
	Mesic Flatwoods	Sandhill	Scrubby Flatwoods
1 Year	0.077	0.055	0.000
2	0.077	0.111	0.000
3	0.154	0.111	0.000
4	0.154	0.222	0.000
5	0.154	0.222	0.000
6	0.077	0.055	0.077
7	0.077	0.055	0.077
8	0.077	0.055	0.077
9	0.077	0.055	0.154
10	0.077	0.055	0.154
11	0.000	0.000	0.154
12	0.000	0.000	0.077
13	0.000	0.000	0.077
14	0.000	0.000	0.077
15	0.000	0.000	0.077
Total	1.001	0.996	1.001

Because of the existing diversity of community types within most burn units, random selection of fire frequencies by dominant communities will add variability beyond that of community-specific frequency ranges. For example, mesic flatwoods or sandhill portions of units dominated by scrubby flatwoods may periodically remain unburned for an additional 5 years.

Deviations from randomly selected burn schedules may be necessary in specific instances. Should drought render natural firebreaks ineffective or increase the likelihood of peat/muck fires in wetlands, fire return intervals will be delayed until the next safe opportunity to burn within prescriptions. In addition, scrub jay management efforts may supersede scheduling of ecological burns in some units. For example, should oak patches approach or exceed dimensions tolerated by jays or burn schedules of contiguous units, including adjacent property, nearly coincide, fire return intervals will be changed to meet specific, immediate objectives.

E. Firing Techniques. A variety of firing techniques will be utilized within and among burns, varying with burn unit size, specific objectives, and fuel and weather conditions, to regulate fire intensity and emissions. However, no aerial ignition is planned at this time. Fuel and vegetation types are widely variable within units creating a situation more manageable through ground ignition.

F. Season and Time of Day. Within safety limits, prescribed burns will be conducted throughout the year to encompass a broad range of weather conditions and phenological stages of flora. The specific season (i.e., spring, summer, fall or winter) of each prescribed fire will be chosen randomly from seasonal selection probabilities weighted 2:1 in favor of growing season burns (i.e., spring and summer). Recognizing that fire may produce different results when applied at different times within seasons, efforts will be made to avoid burning regularly during specific periods within seasons (e.g., early April during spring).

However, peak periods of public recreational use, particularly controlled hunts, may briefly curtail prescribed burning during intervals of some seasons.

Dormant season burns may be needed initially in some units to reduce heavy fuel loads before subsequent ecological burns. More stable weather conditions, particularly wind speed and direction, during winter permit lower fire intensities and diminish spot-over probability (Bunting and Wright 1974). However, growing season burns will be prescribed for all "initial" burns on units where fuel loads and safety considerations permit their use.

Scrub jay management objectives may prevail over random selection of burn seasons in occupied units. To avoid adversely impacting recruitment through increasing the vulnerability of or directly destroying nests, nestlings, or fledglings, no units occupied by scrub-jays will be burned during spring. Instead, when spring is randomly selected for those units, ecological burns will be conducted during summer.

Generally, burning will occur during daylight hours, preferably after the dew evaporates from fine fuels. However, no burning will be initiated prior to 9:00 A.M. (F.A.C. 5I-2.06). Every attempt will be made to complete all burning activities by 5 P.M., or at least 1 hour prior to sunset (F.A.C. 5I-2.06). In cases that merit burning into the night, a permit may be requested from the Division of Forestry.

G. Optimal Weather Conditions. Ideal weather conditions for dormant season burning occur within 1 to several days after the passage of a cold front which has brought 1/4 to 3/4 inches of rainfall. Weather associated with this period generally produces persistent winds with a steady direction, cool temperatures, low relative humidities and sunny days (Wade and Lunsford 1989). Preferred temperatures range from 40° F to 70° F. Preferred relative humidities will vary depending on unit objectives, but are considered ideal when between 30% and 60%.

Relative humidities of 35-60% are preferred for growing season burns. Wind direction should be generally steady with surface wind speeds of 3-12 miles per hour and temperatures of <95 degrees F. Growing season burns will be conducted no more than 3 days after rainfall and only after receiving morning dewfall, unless preceded the previous afternoon by widespread rain.

Night-time burning will be conducted only when the stagnation index permits effective dispersion of smoke. For safe and effective night burning, relative humidities must be in the 20 to 75% range for the 5-hour period following the start of the burn, wind speeds at 20 feet must be between 5 and 20 m.p.h., and wind direction must stay within 45 degrees of the starting direction (Lamb 1969).

Depending on proximity to critical smoke sensitive areas, desired winds are generally westerly to northerly, but can be otherwise if steady. In-stand wind speeds (measured at eye-level) of 1 - 3 mph are preferred for control of fire intensity. Specific prescriptions will be developed with these levels in mind but may be altered somewhat to meet unit goals if safety can be maintained.

"Red Flag" conditions will include minimum relative humidity <35% for 4 consecutive hours or more, relative humidity below 35% for any time period accompanied by sustained surface winds of 15 mph or more, and maximum relative humidity <85% with sustained surface winds >14 mph for 10 hours or more. No prescribed burning will be conducted under any of the above warning conditions.

H. Special Considerations. Approximately 55 acres were machine planted to longleaf pine during winter 1992. Additional plantings of pines, xerophytic oaks, shrubs, grasses, and forbs are anticipated and may require brief intervals of fire exclusion. Burning of units containing artificially regenerated stands will be delayed as needed to ensure protection and establishment of planted flora. Where fire delay is impractical, narrow disc lines will likely be used to exclude fire from vulnerable plots.

In addition, a bald eagle nest, used periodically during the last several years, is located on the adjacent SWFWMD tract within 100 yards of HMWMA. When active, prescribed burning will be delayed from that burn unit.

IV. SMOKE MANAGEMENT

HMWMA lies in a rural location, yet smoke screening radii encompass numerous structures and populated areas sensitive to airborne particulate matter that are a product of fire.

These include several cities or towns, dense, unincorporated residential developments, county roads, state and federal highways, one interstate, hospitals, and airports. Critical smoke sensitive areas near the periphery of the area will necessitate use of narrow wind direction prescriptions and may alter desired firing techniques.

Before developing burn prescriptions, each unit must pass a smoke screening test to determine if burning can be conducted without impacting the areas of concern. Prescriptions will be modified, as needed, to meet considerations of the smoke screening process. Ideal conditions needed to safeguard against problem smoke are a neutral or slightly unstable atmosphere, a mixing height of 1,700-6500 feet above the ground and transport windspeeds exceeding 9 mph, but below 20. These conditions should promote convection, thereby forcing smoke-filled air straight upward into the transport winds with a high level of dissipation.

V. PERSONNEL AND EQUIPMENT NEEDED

A. Personnel. The size of the burning crew will depend largely on fuel types, fuel accumulations and fire weather. However at least 1 person, who has been certified by the Division of Forestry of the Department of Agriculture and Consumer Services, will be in attendance at all times on each of the burns in order to meet the requirements listed in F.S. 590.026(5).

A minimum of 4 experienced crew members will be required for burning in light flashy fuels. Five or 6 crew members are needed in the larger units and areas with heavy rough.

B. Equipment. The following equipment will be readily available and operational on all prescribed burns.

- -- drip torches (2+)
- -- pre-mixed burn fuel (5 gallons)
- -- fuel funnel
- -- matches or lighter
- -- fire flaps (3+)
- -- portable, hand-held radio (1+)
- -- ATVs (2+)
- -- backpack water pump (1+)
- -- truck-mounted water pump, 50+ gallon capacity (1+)
- -- bulldozer/plow unit - DOF standby

-- reserve suppression water (10+ gallons)
-- water for personal consumption
-- shovels (2+)
-- first aid kits (2+)

Pending specific prescriptions, vagaries of fire weather, fuel loading, and special safety precautions, the following additional equipment may be needed.

-- ATV-mounted water pump, 10 gallon capacity
-- Tractor-mounted water pump, 75+ gallon capacity
-- Fire-retardant foam
-- Leaf blower

The following personal protection equipment is needed by all personnel.

-- Nomex shirt or coveralls
-- Cotton or nomex pants
-- Hard hat
-- Face shield or goggles
-- Leather gloves
-- Boots
-- Immediate access (i.e., on person or assigned burn partner) to portable radios on all larger units with heavy fuel loads

VI. PERMITS AND NOTIFICATIONS

The Florida Department of Transportation will be advised of scheduled prescribed fires at least one week in advance of burn dates and requested to temporarily install "FOG/SMOKE" warning signs at recommended locations. A burning permit will be obtained each burn day from the Division of Forestry. Requests for burn authorization will minimally include landowner number(s), STR, and scheduled acreage. Courtesy/safety notifications will be made to nearby landowners, law enforcement agencies, and media. To alert area recreationists, a map of scheduled burn units will be posted prominently on a display board at the check station facility. In addition, a caution sign will be placed near the entrance to the area during prescribed burning.

CONTACT	PHONE
1) Division of Forestry	1-800-226-6486/SC 663-6757
2) Local radio station (WKTK-FM 98.5)	352-563-1985
3) Local newspaper	352-793-2161
4) Sumter County Fire Dispatch	352-793-0222
5) Citrus County Fire Dispatch	352-746-2555
6) Marion County Fire Dispatch	352-369-6779
7) Ventura Ranch	352-748-3161
8) DOT-Leesburg (Steve Scroggie)	352-360-6547
9) Southwest Florida Water Management District	SC 628-4474
10) Drake Ranch	352-732-8025
11) McGregor Smith Tract (Paul Anderson)	352-726-1745
12) Bill Waggener	352-237-5311, cell 895-4284

Table 4. Smoke sensitive areas identified within 20 miles of Half Moon WMA.

East	Communities -	Dallas, Oxford, Wildwood, Coleman, Lady Lake, Fruitland Park
	Major Highways -	I 75, Florida's Turnpike US 441, US 27, US 301, SR 44
Northeast	Communities -	Shady, Pedro, Summerfield, Belleview, Santos, Marion Oaks, Monroes Corner
Southeast	Communities -	Bushnell, Lake Panasoffkee, Sumterville, Coleman, Bevilles Corner St. Catherine
West	Communities -	Inverness, Hernando, Lecanto, Holder, Citrus Springs, Homosassa Springs
	Major Highways -	US 41, US 19
	Other-	Inverness airport, Crystal River airport
Southwest	Communities -	Floral City
Northwest	Communities -	Dunnellon, Beverly Hills
	Other-	Dunnellon airport
South	Communities -	Pineola, Istachatta
	Major Highways -	SR 44, I 75, US 301
North	Communities -	York, Ocala
	Major Highways -	SR 200, I 75, US 301
	Other-	Ocala airport

VII. EVALUATION OF BURN

A post-fire evaluation will be conducted on each unit to determine if assigned burn unit prescriptions met predetermined objectives. Initial evaluations will be completed within 2-4 weeks of each burn. Subsequent assessments will be made 2-4 months and 1 year post-fire to further evaluate burn efficacy.

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SMOKE MANAGEMENT FOR PRESCRIBED BURNING

on

HALF MOON WILDLIFE MANAGEMENT AREA

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Florida Game and Freshwater Fish Commission

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I. Introduction

Prescribed burning is recognized as an important management tool. The smoke produced during burning pollutes the air and prescribed burners have an obligation to reduce adverse environmental impacts. Prescribed burning without smoke management can be a liability risk.

The goals for smoke management planning on Half Moon Wildlife Management Area (HMWMA) are to 1) identify smoke sensitive and critical smoke sensitive areas that could be impacted by controlled burning; 2) determine preferred and acceptable wind directions for using prescribed fire on each burn unit; 3) identify acceptable dispersion index, mixing height and

transport winds; and 4) establish procedures for posting warning signs along smoke impacted roadways and gathering relevant weather data on burn day.

II. Definition and identification of smoke impacted areas

The smoke screening system used for smoke management on HMWMA is the 5 step system described by the USFS[1]. These steps included determining fuel type and firing technique, plotting the direction and impact zone of the smoke plume, identifying smoke sensitive areas, identifying critical smoke sensitive areas, and minimizing risk.

The extent of smoke impact is based primarily on fuel type and firing technique. Many HMWMA burn units are primarily grassy fuels, but most contain some palmetto-gallberry component. This fuel type, which produces more smoke than grassy fuels, was used for smoke management decisions for all burn units. Using this fuel type along with line-heading firing technique, a smoke movement estimate of 20 miles downwind was projected for all burn units on the area. After this general impact zone was determined two types of smoke sensitive areas were identified as defined by USFS[1]. These definitions are excerpted below.

Smoke sensitive areas - areas such as airports, communities, recreation areas, schools, hospitals, and factories within the smoke impact zone. Possible smoke sensitive areas within 20 miles and their position relative to HMWMA are listed in Table 1.

Critical smoke sensitive areas - smoke sensitive areas that are within 2 miles downwind of the burn unit. The smoke screening systems calls for a change in burn prescription if any

critical smoke sensitive areas are identified within the projected smoke plume. Preferred (those that should not impact critical smoke sensitive areas) and unacceptable (those which may impact smoke sensitive areas) wind directions were determined for each HMWMA burn unit and are reported in Table 2.

Critical smoke sensitive areas were identified for each burn zone. The burn units in zone MCS should not be burned on northerly winds because of residences to the south and the proximity of SR 44 (1.5 miles south). Units in zone MCN1 should not be burned on an east wind due to homes along the Withlacoochee River. Burn units in the western portion of MCN2 should not be burned on an east wind for the same reason. Units in MCN3 should not be burned on a south wind, especially southwesterly. Homes in Marion Oaks could be impacted.

[1] Wade, D.D. and Lunsford, J.D. 1989. A guide for prescribed burning in southern forests. USFS technical publication R8-TP11 56pp.

III. Acceptable daytime dispersion index levels, mixing height, transport winds.

Due to the proximity of HMWMA to smoke sensitive areas the following conditions must be met to minimize adverse impacts from smoke.

Dispersion index levels - Estimates between 41 and 60 are acceptable for small fires and low levels of burning activity. As size of fires increase or number of units burned on a particular day increases, the index value should be greater. If the dispersion index is greater than 100 fire conditions may be so good that fire control may be a problem.

Mixing height - Should be 1650 feet (500 meters) or greater.

Transport winds - Should be 9 mph (4 meters/second) or greater.

IV. Procedures for posting of smoke warning signs and obtaining smoke management weather information.

Smoke warning signs must be posted during controlled burning on HMWMA. A warning sign should be placed at the entrance to the area as well as on the public access road nearest to the burn unit for that particular burn day. These signs are the responsibility of FWC personnel.

State road 44 should be posted with smoke hazard signs regardless of predicted wind direction. Signs should be placed one mile west of the Withlacoochee River bridge and just west of the intersection of State Road 44 and Sumter County 470. If burns are conducted on easterly winds, the Withlacoochee bridge on State Road 200 should be posted due to down drainage movement of smoke after dark. These warning signs are erected by Florida Department of Transportation personnel. For SR 44 signs, contact Steve Scroggie (assistant engineer) or David Denson (regional engineer) at the Leesburg office (904-360-6552). For SR 200 signs, contact Doug Mumford or Jack Wesselhoff at the Ocala office (904-732-1338). Notify DOT at least 24 hours before burn day to request sign placement. Also, notify the respective offices when the signs are no longer needed.

Smoke management weather information is provided by the U.S. Weather Service or the Florida Division of Forestry on burn day. Call the weather service at (813)-645-2323 and ask for the Fire Weather forecaster on duty. He will require the section, township and range for the area (section 19, township 18S, range 21E for HMWMA) as well as current temperature, humidity, and wind speed and direction on site. This should be called in by 7:30 AM for burns scheduled to start at 9:00 AM. DOF can be reached in Brooksville at (904)-796-5650 or 1-800-226-6486. DOF weather forecasts are usually available by 8:30 AM.

Table 1. Smoke sensitive areas identified within 20 miles of Half Moon WMA.

East	Communities -	Dallas, Oxford, Wildwood, Coleman, Lady Lake, Fruitland Park
	Major highways -	I 75, Florida's Turnpike US 441, US 27, US 301, SR 44
Northeast	Communities -	Shady, Pedro, Summerfield, Belleview, Santos, Marion Oaks, Monroes Corner
Southeast	Communities -	Bushnell, Lake Panasoffkee, Sumterville, Coleman, Bevilles Corner St. Catherine
West	Communities -	Inverness, Hernando, Lecanto, Holder, Citrus Springs, Homosassa Springs
	Major highways -	US 41, US 19
	Other -	Inverness airport, Crystal River airport
Southwest	Communities -	Floral City
Northwest	Communities -	Dunnellon, Beverly Hills
	Other -	Dunnellon airport
South	Communities -	Pineola, Istachatta
	Major Highways -	SR 44, I 75, US 301
North	Communities -	York, Ocala
	Major highways -	SR 200, I 75, US 301
	Other -	Ocala airport

Table 2. Preferred and unacceptable wind directions for meeting smoke management objectives on Half Moon WMA burn units.

Zone	Burn unit	Preferred wind	Unacceptable winds
MCS	1	South	North, West, N. East, N. West
MCS	2	South	North, West, N. East, N. West MCS
3	South	North, N. East, N. West	
MCS	4	South	North, N. East, N. West
MCS	5	West	North
MCS	6	West	North
MCS	7	South	North
MCS	8	South	North
MCS	9	South	North, N. East, N. West
MCN1	1	West	East, N. East, S. East
MCN1	2	S. West	East, N. East, S. East
MCN1	3	S. West	East, N. East, S. East
MCN1	4	S. West	East, N. East, S. East
MCN1	5	West	East, N. East, S. East
MCN1	6	West	East, N. East, S. East
MCN1	7	West	East, N. East, S. East
MCN1	8	West	East, N. East, S. East
MCN1	9	West	East, N. East, S. East
MCN1	10	West	East, N. East. S. East
MCN1	11	South	East, N. East, S. East
MCN2	1	West	East, N. East, S. East
MCN2	2	West	East, N. East, S. East
MCN2	3	West	East, N. East, S. East
MCN2	4	West	East, N. East, S. East
MCN2	5	West	East, N. East, S. East
MCN2	6	South	
MCN2	7	South	
MCN3	1	N. West	South, East, S. East, S. West
MCN3	2	N. West	South, East, S. East, S. West
MCN3	3	N. West	South, East, S. East, S. West
MCN3	4	N. West	South, East, S. East, S. West
MCN3	5	North	South, S. East, S. West
MCN3	6	North	South, S. East, S. West
MCN3	7	North	South, S. East, S. West
MCN3	8	N. West	South, S. East, S. West
MCN3	9	N. West	South, S. East, S. West

APPENDIX X

Public Involvement

Half Moon Wildlife Management Area
Management Advisory Group
(Consensus Meeting Results)

11-17-99 - Sumterville, FL

The purpose of consensus meetings is to assist the Fish and Wildlife Conservation Commission (FWC) in its planning effort by involving a diverse group of "stakeholders" in development of a rational management concept for managed-area lands. The agency does this by asking spokespersons for these stakeholders to participate in a half-day meeting to provide ideas about how the lands should be managed.

The Half Moon consensus meeting was held on the morning of November 17, 1999 at the Lake Sumter Community College, in Sumterville, Florida. The items found below represent the most important considerations, as determined by a group vote, for the Half Moon WMA conceptual management plan (CMP) update.

The items below represent a valuable source of information, provided by Florida citizens, that will be used by biologists, planners, planning coordinators, administrators and others during the CMP update for the Half Moon WMA. This CMP update, upon FWC and Governor & Cabinet approval, will guide the activities of Commission personnel over the five year life of the planning cycle, and help meet planning requirements of the agency, as well as those of the state and federal governments.

Numbers to the left of **bold-faced items** below represent the numbers of total votes, and the "scores" of each item (the lower score means higher importance, and is used to break ties when two or more items have the same number of total votes). Items receiving no votes are listed, but carry no judgement with regard to group priority. (These items represent good input, and may be used in planning, but with the recognition that the group did not rank them as top-five priorities.) Statements in parentheses following the bold-faced items represent a staff synopsis of clarification for "one-liners" as inscribed by the recorder at the meeting. Items are ranked in priority order.

# Votes	**Score**		
[7]	[11]	**1.**	**Preserve wildlife, habitat, and cultural resources for future generations.** (Self-explanatory)
[7]	[22]	**2.**	**Increase the fire management program and emphasize growing season burns.**

(We need a more aggressive fire management program; work with the Division of Forestry and be the pacesetters; growing season burns are very important for native plant and animal communities.)

[6] [13] **3.** **Manage this land to promote native plant communities.**
(Self-explanatory)

[6] [15] **4**. **Continue the policy prohibiting power boats in Gum Slough.**
(Self-explanatory)

[5] [15] **5.** **Aggressively control exotic plants and feral hogs.**
(Exotics threaten native wildlife and vegetative communities; use whatever management measures are necessary to effect control.)

[5] [16] **6.** **Establish a wildlife refuge area within the property.**
(Every square foot on the area does not need to be hunted.)

[4] [12] **7.** (two items of equal rank)

A **Minimize conflict between user groups, while affording opportunity to all current user groups**.
(This means eliminate conflicts caused by group interactions, but also allow equitable opportunities among groups for them to pay their way.)

B. **Pursue a lease from DEP for soveriegn lands.**
(FWC needs control over sovereign lands in order to better enforce laws.)

[4] [14] **8.** **Increase public educational programs on the property, including information regarding Adaptive Management projects.** (Self-explanatory)

[3] [5] **9.** **<u>Ensure the compatibility of fire management with recreational uses, and with timber and wildlife management.</u>**
(Self-explanatory)

[3] [6] **10.** **<u>Keep the HMWMA property open to all user groups (avoid dominance by one group or agency).</u>**
(We are all taxpayers, and thus deserve an equal chance to enjoy the land and its resources and opportunities.)

[3] [8] **11.** **<u>Monitor and manage for listed species (endangered, threatened, and species of special concern).</u>**
(Self-explanatory)

[3] [13] **12**. **<u>Pursue adjacent land acquisitions.</u>**
(FWC missed a recent opportunity to acquire important lands due to mineral rights issues; we should work harder to acquire these lands needed for management and protection.)

[3] [14] **13.** **<u>Maintain/manage game species for quality hunting opportunities.</u>**
(This does not refer to Quality Deer Management, but to high-quality recreational hunting opportunities in general.)

[2] [5] **14.** (two items of equal rank)

A. **<u>Establish wildlife food plots.</u>**
(This means in both hunted and unhunted areas, but on previously-disturbed sites, not on native groundcover.)

B. **<u>Increase public vehicular access to the WMA.</u>**

(This means we need increased public vehicular access; some taxpayers are excluded from the area.)

[2] [6] **15.** (two items of equal rank)

A. **<u>Establish a recreational use capacity</u>**.
(This means determine levels that won't detract from the human experience or the welfare of animals.)

B. **<u>Allow management personel to determine appropriate levels of vehicular use (ATV, swamp buggy, air-boat, etc.)</u>**
(Self explanatory)

[2] [8] **16**. (three items of equal rank)

A. **<u>Increase public awareness of opportunities on the property.</u>**
(Self explanatory.)

B. **<u>Implement more aggressive poaching enforcement.</u>**
(Half Moon is one of the cheapest places to poach at only $55.00 for the ticket.)

C. **<u>Estimate projected costs for management and uses.</u>**
(Self explanatory.)

[2] [9] **17**. **<u>Establish non-consumptive user fees.</u>**
(Hunters must have licences, a $25.00 WMA stamp, etc.; something less would be okay for non-consumptive users, but they should pay something.)

[2] [10] **18.** **<u>Manage game harvest by number of animals taken.</u>**
(Manage the animal populations to make them visible for viewing; don't just use people quotas.)

[1] [1] **19.** **<u>Integrate the use of FWC and SWFWMD lands.</u>**
(Trail networks should be contiguous; make jurisdictional lines invisible to users.)

[1] [2] **20.** (three items of equal rank)

A. **<u>Return funds generated on the property back for maintenance and upkeep.</u>**
(Self-explanatory.)

B. **<u>Encourage and promote cooperation between the National Wild Turkey Federation and FWC for youth involvement in habitat management.</u>**
(Self-explanatory.)

C. **<u>Maintain public usage and access at current levels.</u>**
(Self-explanatory.)

[1] [3] **21.** (five items of equal rank)

A. **<u>Establish a safety buffer zone for neighboring lands.</u>**
(This would be for dual purposes; safety for adjacent residents and refuge for wildlife.)

B. **<u>Assure safety and welfare of property and persons on the adjacent outpost camp.</u>**
(Alcohol with weapons is a problem; posting of the Boy Scout boundary will help.)

C. **<u>Establish boundary lines for fire control purposes.</u>**

(This means for fire control and for user group identification of boundaries.)

D. **<u>Ensure implementation of the management plan.</u>**
(Self-explanatory.)

E. **<u>Develop a National Wild Turkey Federation Superfund proposal to Larry Perrin for the year 2000.</u>**
(Self-explanatory.)

[1] [4] **22.** (three items of equal rank)

A. **<u>Increase and maintain scrub jay habitat.</u>**
(Scrub-jays are listed species and need protection.)

B. **<u>Establish hiking and horseback trails utilizing tram line and fire breaks.</u>**
(Self-explanatory.)

C. **<u>Increase small game hunting opportunities (add seasons, establish dove fields, etc.).</u>**
(Increase season lengths and enhance opportunities; especially dove fields or other.)

[1] [5] **23.** (two items of equal rank)

A. **<u>The management plan should include provisions to prevent noise and control water consumption and mining.</u>**
(Self-explanatory.)

B. **<u>Define the role of Half Moon WMA in the state Greenways program.</u>**
(The public use greenways corridor could incorporate the HMWMA.)

The following items received no top-five votes for priority, but are included because they represent important input for planning:

Provide areas and structures for undisturbed wildlife viewing.
(Integrate food plots and management to include areas for wildlife viewing; establish blinds for non-consumptive activities.)

Implement special-use hunts.
(This would be for eliminating hogs, and for generating revenue; special opportunity hunts.)

Limit incompatible uses during hunts.
(There are roughly 30 days in the year when hunting is allowed; safety would be the primary consideration.)

Use mechanical means for habitat management when needed.
(This means to include roller-chopping, tree cutting, etc.; but only when necessary.)

Accomodate research to determine the most effective methods for restoring and sustaining native plant and animal communities.
(The Adaptive Management Section was created to do this, and is doing it statewide; accommodate science-based management on the area.)

Half Moon WMA Stakeholders

A. Active Participants

Name	Affiliation
Neighboring Land Owners/Managers:	
1. Bill Waggener	Rocking F Ranch, Seven Springs (also has HM grazing lease)
Government Agencies:	
2. Donald Todd	Soil & Water Conservation District
3. Joey Chandler	Local Government (County Commissioner)
4. Ernie Smith	Senior Ranger, Division of Forestry
5. Darrell Freeman	SWFWMD, Land Management Section
6. Nancy Dwyer	FWC, Division of Wildlife
7. Ken Hensley	FWC, Law Enforcement
8. Wayne Jones	FL Division of Forestry
Area Users:	
9. Paul Anderson	Boy Scouts of America (leases adj. Smith tract)
10. Bob Barnard	Wild Turkey Federation
11.Trish Cheston	Horseback Riders
12. Linda Dawson	Florida Trail Association
Conservation Organizations:	
13. Dick Sisolak	Citrus County Chapter of Audubon Society

B. Supportive Participants

14. David Brown	SWFWMD, Land Management
15. Robert Magliavas	SWFWMD, Land Use & Recreation
16. Trusten Drake	Neighbor (Drake Ranch)
17. Lou Sanchez	Neighbor (local landowner)
18. Mike Abbott	FWC, Regional Biologist
19. Doug Franke	FWC, District Biologist
20. Kelly Mizell	FWC, Supervisor, Adaptive Management
21. Kent Williges	FWC, Biologist, Adaptive Management
22. Scott Berish	FWC, Biologist, Adaptive Management

Planning Team (Facilitation Process)

Hugh Boyter	FWC, Supervisor, Planning Section
Keith Singleton	FWC, Biologist, Planning Section
David Alden	FWC, Biologist, Planning Section
Leo Minasian	FWC, Biologist, Planning / Adaptive Mgt.

PUBLIC HEARING REPORT
FOR

HALF MOON WMA CONCEPTUAL MANAGEMENT PLAN
HELD BY THE

HALF MOON WMA MANAGEMENT ADVISORY GROUP

(DECEMBER 2, 1999 - BUSHNELL, FLORIDA)

Mr. Hugh Boyter, Biological Scientist and Chief of Planning for the Division of Wildlife, opened the meeting promptly at 7:30 PM as advertised in compliance with Chapter 259.032 (10), F.S. There were four members of the Management Advisory Group (MAG), two of which were FWC employees. A total of six FWC employees were in attendance, including two area biologists, the regional biologist, law enforcement officer, and two FWC planning staff.

Mr. Boyter introduced MAG member and Biological Scientist in charge of management for Half Moon WMA, Ms. Nancy Dwyer. Ms. Dwyer presented the draft goals, objectives, problems, strategies and management intent language to be included in the CMP update.

Following the presentation of the updated language for the new Half Moon CMP, there was discussion among participants concerning management issues on Half Moon WMA. One such concern was equestrian uses. Equestrian use may adversely impact roads used for vehicular traffic, or conflict with vehicular traffic in other ways. Use of existing trams for equestrian trails was offered as one way to provide for that recreational use. Another concern relating to equestrian use was the introduction of exotics by horses. It is uncertain that this would pose a significant problem on Half Moon. Half Moon WMA is still relatively unknown for its equestrian use, but there is certainly potential for increasing this use in the future.

One of the Management Advisory Group members inquired about the use of volunteers to help achieve management objectives, especially assist with recreational development. Commission staff responded that volunteer participation is sought and encouraged.

Other discussions addressed how MAG input is integrated with establishment of management goals and objectives, and the overall planning process used for the Commission's system of Wildlife Management Areas. The hearing was adjourned at 8:30 PM.

PUBLIC NOTICE

The Florida Fish and Wildlife Conservation Commission (FWC) announces a meeting of the Management Advisory Group for the **Half Moon Wildlife Management Area**, located along the Withlacoochee River near Wildwood in Sumter County.

DATE AND TIME: **Wednesday, November 17, 1999, 9:00 AM**

PLACE: **Sumterville Campus**
Lake/Sumter Community College
Adult Education Building, Room 101
1425 County Road 526A
Sumterville, Florida

PURPOSE: To convene a meeting of stakeholders to provide priority considerations to FWC for future management of the Half Moon Wildlife Management Area. The input received will be used to prepare an update of the five-year Conceptual Management Plan for the wildlife management area.

PUBLIC NOTICE

The Florida Fish and Wildlife Conservation Commission
announces a **PUBLIC HEARING** for the
Half Moon Wildlife Management Area,
located near Wildwood, in Sumter County, Florida.

DATE AND TIME: Thursday, December 2, 1999, 7:30 P.M.

LOCATION: Sumter County Commission Chambers
209 North Florida Street
Bushnell, Florida.

PURPOSE: To receive public comments regarding considerations for updating the five-year Conceptual Management Plan (CMP) for the Half Moon WMA.

Participants in this hearing should understand that the purpose for this hearing does not include the opportunity to discuss public use and/or hunting regulations for Half Moon WMA. There is a separate public process for this purpose. This hearing is designed exclusively for discussion of the draft management plan.

*A copy of the Half moon WMA **Management Prospectus** is available upon request from David Alden, Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, Florida, 32399-1600. Telephone: (850) 922-8777.*

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

October 26, 1999

Ms. Tina Chavez
Sumter County Board of County Commissioners
209 North Florida Street
Bushnell, Florida 33513

Dear Ms. Chavez:

The Florida Fish and Wildlife Conservation Commission (FWC), Division of Wildlife will be conducting a public hearing in coordination with the Half Moon Wildlife Management Area Management Advisory Group on Thursday, December 2, 1999 at 7:30 PM. The purpose of this meeting will be to present to the public management priorities and intent for the Half Moon Wildlife Management Area, located in Sumter County near Wildwood.

In compliance with subsection 259.032(10), Florida Statutes, the FWC requests that an information item be placed on the Sumter County Commission agenda for Tuesday, November 9, 1999, to announce the FWC public hearing for the Half Moon WMA. Enclosed is a copy of subsection 259.032(10), Florida Statutes and a copy of the public hearing notice.

If you have any questions or concerns, please call me at (850) 488-3831. Your consideration and attention to this matter are greatly appreciated.

Sincerely,

Leo L. Minasian, Jr.
Bureau of Wildlife Management
Division of Wildlife

LLM/
WLD 8-5-2,AndrewsWMA

APPENDIX XI

1999-2000 Half Moon WMA annual operational plan

Florida Game and Fresh Water Fish Commission
Central Region - Nonresource Projects
1999-00 Annual Work Plan - Development and Maintenance

7329 HALF MOON (W35-4716)

Development Activities	Man-Days	Salaries	Expenses	Total	Plans
1010 Project Inspection	5.00	965.00	105.00	1,070.00	INSPECT, MONITOR AND REVIEW EXISTING AND FUTURE FIELD PROJECTS.
1020 Planning Activities	2.00	386.00	42.00	428.00	PLAN AND COORDINATE MANAGEMENT ACTIVITIES.
1030 Attendance at Workshops, Conferences, an	8.00	1,544.00	543.00	2,087.00	ATTEND SOUTHEASTERN WILDLIFE CONFERENCE AND MEETINGS WITH COOPERATING AGENCIES AND LANDOWNERS (EXP-4716-$375 PER DIEM).
1040 Report Writing, Editing and Manuscript P	7.00	1,351.00	222.00	1,573.00	PREPARE AND EDIT ANNUAL REPORTS AND OTHER MISC. REPORTS (EXP-4716-$75).
1070 Personnel Management	2.00	386.00	92.00	478.00	ADVERTIZE, HIRE AND TRAIN OPS PERSONNEL FOR OPERATION OF CHECK STATION. EVALUATE AND COUNSEL EMPLOYEES (EXP-4716-$50).
1090 Budget Administration	10.00	1,930.00	210.00	2,140.00	DEVELOP AND EDIT ANNUAL WORK PLANS. MONITOR BUDGET EXPENDITURES.
1100 Data Management	10.00	1,930.00	510.00	2,440.00	ESTABLISH, COMPILE, EDIT AND ANALYZE BIOLOGICAL AND RESOURCE USE DATA (EXP-4716-$300).
1110 Public Hunting Use Administration	10.00	1,930.00	210.00	2,140.00	DEVELOP, EDIT AND REVIEW HUNT BROCHURES AND MAPS.
1140 Contract Development (Cattle Grazing)	10.00	1,930.00	210.00	2,140.00	REVIEW GRAZING CONTRACT AND MONITOR GRAZING ACTIVITIES.
1990 Other Administration	220.00	42,460.00	7,770.00	50,230.00	ATTEND BWM STAFF AND REGIONAL MEETINGS, ROUTINE PAPERWORK, CORRESPONDENCE, SPEAKING ENGAGEMENTS, SECRETARIAL DUTIES (EXP-4716-$2,800--INCLUDES COPIER LEASE PAYMENT OF $849/YR)(EXP-4716-$350 PER DIEM).
2010 Buildings	18.00	3,474.00	8,878.00	12,352.00	REPLACE ROOF AND DAMAGED SIDING AND REPAIR ELECTRICAL WIRING TO ONE CHECK STATION AND ONE NECROPSY SHED (EXP-4716-$3,500. MAINTAIN ONE TRACTOR SHED, ONE OFFICE UNIT, ONE SIGN SHOP, AND ONE STORAGE BUILDING. REPLACE ROOF ON TRACTOR SHED (EXP-4716-$5,000).
2040 Roads & Bridges	35.00	6,755.00	11,935.00	18,690.00	MAINTAIN 12 MILES OF ACCESS ROADS. CHEMICALLY TREAT VEGETATION WITHIN LIMEROCK-CAPPED ROADS. RESURFACE ONE MILE OF ROAD (EXP-4716-$11,200).
2050 Trails	10.00	1,930.00	610.00	2,540.00	DEVELOP HIKING TRAIL AND MAPS (EXP-4716-$400).
2070 Fences	10.00	1,930.00	1,285.00	3,215.00	MAINTAIN PERIMETER AND CROSS FENCES AND GATES. SUPERVISE REMOVAL OF OLD FENCE MATERIAL (EXP-4716-$1,075).

9-1

Florida Game and Fresh Water Fish Commission
Central Region - Nonresource Projects
1999-00 Annual Work Plan - Development and Maintenance

7319 HALF MOON (WS-4716)

Development Activities (Continued)	Man-Days	Salaries	Expenses	Total	Plans
2080 Public Use Facilities	6.00	1,158.00	1,426.00	2,584.00	RENT PORTABLE TOILET DURING HUNTING SEASONS (EXP-4716-$300). MAINTAIN AND ENHANCE CHECK STATION PARKING AREAS. REPLACE ONE KIOSK (EXP-4716-$1,000).
2090 Boundary Signs	5.00	965.00	155.00	1,120.00	COORDINATE POSTING FOR 20 MILES OF PERIMETER WITH LAW ENFORCEMENT (EXP-4716-$50).
2100 Informational Signs	4.00	772.00	434.00	1,206.00	MAINTAIN NUMEROUS DIRECTIONAL, PARKING AREA, AND ENTRANCE SIGNS (EXP-4716-$350).
2110 Custodial Functions	8.00	1,544.00	268.00	1,812.00	EVICT TRESPASS LIVESTOCK. REMOVAL AND DISPOSAL OF ABANDONED FARM SUPPLIES AND HAY BAILS (EXP-4716-$100). NFA
2120 Vehicle & Equipment Maintenance	39.00	7,527.00	8,319.00	15,846.00	MAINTENANCE AND REPAIRS TO THREE TRUCKS, TWO ATVs, ONE TRACTOR AND MISCELLANEOUS IMPLEMENTS (EXP-4716-$7,500).
3020 Herbaceous Seedings	5.00	940.00	505.00	1,445.00	REVEGETATE DISKED INTERIOR FIREBREAKS. PLANT NATIVE, NON-INVASIVE AGRONOMIC SPECIES IN FOOD PLOT (EXP-4716-$400).
3040 Prescribed Burning (growing season)	12.00	2,316.00	627.00	2,943.00	PRESCRIBE BURN 300+ ACRES (EXP-4816-$300)(EXP-4816-$75 PER DIEM).
3050 Prescribed Burning (dormant season)	28.00	5,404.00	3,688.00	9,092.00	PRESCRIBE BURN 1,200 ACRES. USE AERIAL IGNITION TO HELP FACILITATE BURN PROGRAM (EXP-4816-8 HRS HELICOPTER AIR-TIME $2,120 + AERIAL IGNITION SUPPLIES $870) (EXP-4816-$110 PER DIEM).
3070 Mechanical Vegetation Control (native)	22.00	4,246.00	4,262.00	8,508.00	PERIODIC MOWING OF APPROXIMATELY 150 ACRES OF WILDLIFE OPENINGS. ONE MONTH RENTAL OF HEAVY EQUIPMENT FOR SCRUB VEGETATION MANAGEMENT (EXP-4816-$3,800).
3080 Chemical Vegetation Control (exotic)	8.00	1,544.00	368.00	1,912.00	CHEMICALLY TREAT COGON GRASS AND TROPICAL SODA APPLE (EXP-4816-$200).
3100 Firebreaks	10.00	1,930.00	210.00	2,140.00	DISK AND MAINTAIN TWENTY MILES OF INTERIOR FIREBREAKS AS NEEDED.
3120 Timber Management	3.00	579.00	163.00	742.00	INVESTIGATE AND PLAN TIMBER HARVESTING POSSIBILITIES (EXP-4816-$100).
3130 Nest Structures	7.00	1,351.00	447.00	1,798.00	MAINTAIN AND MONITOR 18 WOOD DUCK, 5 KESTREL, AND 15 BLUEBIRD NESTING BOXES (EXP-4816-$300).

9-3

Florida Game and Fresh Water Fish Commission
Central Region - Nonresource Projects
1999-00 Annual Work Plan - Development and Maintenance

7329 HALF MOON (W35-4716)

D[illegible]opment Activities (Continued)	Man-Days	Salaries	Expenses	Total	Plans
3150 Vegetation or Habitat Surveys and Invest	7.00	1,351.00	347.00	1,698.00	UPDATE AREA FLORAL LIST. MONITOR AND PHOTOGRAPH VEGETATION COMMUNITIES AT 17 PERMENANT PHOTO POINTS. (EXP-4816-$200).
4040 Wildlife Population Surveys and Investig	72.00	13,896.00	2,012.00	15,908.00	LABORATORY ANALYSIS, POPULATION INVENTORIES OF BOBCAT, COYOTE, DEER, HOG, GOPHER TORTOISE* AND FLORIDA SCRUB JAYS (EXP-4816-$350)(EXP-4816-$50 PER DIEM). COLLECTION OF MERPS FOR EDUCATION PROGRAMS* (EXP-4816-$100,* NFA).
4050 Managed Public Hunts	50.00	9,650.00	4,363.16	14,013.16	PREPARATION AND ADMINISTRATION OF PUBLIC HUNTS. COLLECT DEER, HOG, TURKEY, SMALL GAME HARVESTS AND OTHER BIOLOGICAL DATA AT CHECK STATION. PURCHASE CHECK STATION SUPPLIES (EXP-4816-$300) (OPS-543.5 HOURS, 4899-$3,013.16).
5020 Request for Information and Assistance	2.00	386.00	42.00	428.00	ASSIST COOPERATING AGENCIES AND PUBLIC WITH RESOURCE DATA AND MANAGEMENT. RESPOND TO PUBLIC INFORMATION REQUESTS.
Subtotals for Development	645.00	124,460.00	60,258.16	184,718.16	
Totals for Project	645.00	124,460.00	60,258.16	184,718.16	

APPENDIX XII

Compliance with Sumter County comprehensive plan

Sumter County Board of County Commissioners
Division of Planning and Development
209 North Florida Street
Bushnell, FL 33513

April 17, 2000

Mr. Leo L. Minasian, Jr.
Bureau of Wildlife Management
Fish and Wildlife Conservation Commission
620 S. Meridian Street
Tallahassee, FL 32399-1600

Re: Half Moon WMA CMP

Dear Leo:

I have reviewed the draft management plan for the Half Moon Wildlife Management Area for consistency with Sumter County Comprehensive Plan, and find that it is consistent with the goals, objectives and policies therein. The primary goal of the Conservation Element is to conserve, protect and manage the natural resources of the County. The draft plan, and the efforts of the Bureau, certainly are in accord with that goal.

The land use of Half Moon is Conservation, which is appropriate for lands under the ownership of the State for conservation purposes.

Thank you for allowing me to review the draft. If I can be of further assistance, please feel free to call.

Yours truly,
Roberta Rogers
Roberta Rogers
Principal Planner

Telephone: 352-568-6625 SunCom: 665-6625 Fax: 352-793-0206
E-Mail: rrogers@bocc.co.sumter.fl.us

APPENDIX XIII

Florida Scrub-Jay Habitat Management Plan

Half Moon WMA

Florida Scrub-Jay Habitat Management Plan

Half Moon WMA

INTRODUCTION

Half Moon Wildlife Management Area (Half Moon) lies in northwestern Sumter County, which hosts the largest and one of the few remaining populations of Florida scrub-jays (*Aphelocoma coerulescens*) in the county. These scrub-jays are part of the Northern Gulf Coast Subregion, one of five scrub-jay population subregions corresponding to the major sand deposits on the Florida peninsula (Fitzpatrick *et al.* 1994). None of the Sumter County scrub-jays inhabit typical scrub but instead rely on scrubby flatwoods.

Half Moon habitat used by scrub-jays often lacks the classic open patches of bare sand needed by the birds. Some scrub-jay territories include unimproved roads and fire lanes which the birds use for foraging and acorn-caching. Most of these fire lanes are peripheral and thus are disced annually.

At least half of Half Moon's scrub-jay groups reside near the management area's eastern boundary and use adjoining privately-owned land (Ventura Ranch). In 1996 some of this land was cleared and planted with slash pine (*Pinus elliottii*). Although initially providing some open habitat, this plantation may negatively affect local scrub-jays as the pines grow.

POPULATION SURVEYS

Scrub-jay surveys are conducted on calm, clear days beginning one hour after sunrise and ending before midday heat or wind. An audio tape recording of scrub-jay territorial calls and scolds, including the female "hiccup" call, is broadcast at each station for at least one minute in all 4 directions (4 min. total) to attract jays. Playback stations should be 100-200 m apart.

Areas should be visited as often as necessary to establish an accurate count of jay groups and individuals. A minimum of three visits should be made to a site during March, September or October before that site is deemed unoccupied. Reproductive success can be monitored in mid-summer (July), when young of the year are independent but still distinguishable by plumage (Fitzpatrick *et al.* 1991).

A baseline survey conducted on Half Moon in 1990 detected an estimated 15 scrub-jay groups, consisting of 1-6 birds. In 1992, 17 groups comprising 57 individuals were located and one additional individual was observed in another area in spring, 1993. An estimated 700 acres were used by these jays although territory size averages only 25 acres (Fitzpatrick *et al.* 1991). In 1995, 38 birds in 13 groups were identified. The apparent population decline continued, with only 33 birds in 14 groups counted in 1997. Although some of these groups were new, eight previously identified groups were still missing. An inventory in summer 1997 resulted in 17 juvenals counted, with a total scrub-jay population of 50 using Half Moon (Table 1). Extremely high water and a staff shortage hindered a complete census in 1998; only 7 groups comprising 14 individuals were observed. Again in 1999, survey effort was inadequate to assess the population. During 9 mornings of Florida scrub jay surveys in April, May and August, only 5 individuals were observed. Monitoring Half Moon's scrub jay population will require more survey effort during optimal times and banding will be considered as a tool.

HABITAT MANAGEMENT

Optimal scrub-jay habitat consists of scrub oak species 1-3 m high covering 50-75% of the area, 10-30% bare sandy patches, and scattered-tree canopy coverage of less than 20% (Cox 1987, Fernald 1989, Woolfenden and Fitzpatrick 1984, Fitzpatrick *et al.* 1991). Scrub oak species include sand live oak (*Quercus geminata*), myrtle oak (*Q. myrtifolia*), Chapman oak (*Q. chapmanii*) and scrub oak (*Q. inopina*). The latter two species have not been observed on Half Moon. Other habitat features preferred by scrub-jays include a matrix of recently burned flatwoods and marshes, few or no patches unburned for more than 20 years, and few or no

dense stands of trees within or adjacent to managed scrub (Fitzpatrick *et al.* 1991).

Prescribed Burning - Fitzpatrick *et al.* (1991) state that fire is the preferred method of scrub habitat management. Fire frequencies for maintaining scrubby flatwoods range from 5-10 years, while fire in oak-dominated scrubs only occurs every 10-20 years or longer Myers (1991). Fires every 2-4 years maintain oaks below acorn-bearing height and may encourage saw palmettos (*Serenoa repens*) at the expense of oaks. Summer, or growing-season, burns may help control palmettos, thereby maintaining the open patches needed by scrub-jays. Summer burns are also more likely to kill oaks and are sometimes necessary if the scrub is overgrown. Summer burns are preferable to winter burns because scrub-jays have time for territorial boundary adjustments before acorn caching is completed and spring hawk migration occurs (Woolfenden and Fitzpatrick 1996).

Fitzpatrick *et al.* (1991) recommend burning every 10-20 years to maintain optimal scrub-jay habitat, whereas Cox (1994) suggests a fire frequency of five years and Woolfenden and Fizpatrick (1996) suggest a fire return interval of 8-15 years. A fire frequency of >20 years results in oak scrub that is too tall and dense for scrub-jays. Given Half Moon's scrubby flatwoods vegetation, fires should occur every 5-10 years to maintain scrub-jay habitat, targeting every 6-8 years for burning any scrub-jay occupied area.

An entire scrub-jay group territory should not be burned at one time. Burn units should be relatively small (15-30 ac) and should bisect scrub-jay occupied areas. No more than 25% of an area occupied by jays should be burned at once (Fitzpatrick *et al.* 1991). Fire in scrub tends to burn some vegetation patches while leaving other areas unburned. Woolfenden and Fitzpatrick (1996) state that few scrub-jay families must relocate to survive after a fire due to the size and spacing of these naturally unburned patches. Small, unburned patches will provide cover, nesting habitat and foraging sites for jays while the scrub rapidly regenerates.

It is critical to include buffer habitat around scrub patches and to maintain or create corridors between patches of suitable habitat to facilitate dispersal (Root 1996). Aggressive prescribed burning, where possible, of stands adjacent to scrub areas should help to maintain open habitat through which the jays will traverse. To minimize disruption to scrub-jay territories, prescribed burning and other management activities should be coordinated with adjacent landowners, specifically Southwest Florida Water Management District and Ventura Ranch.

Mechanical Alteration - Although fire is the best tool for scrub management, mechanical manipulation of vegetation is sometimes needed to enable fire to penetrate dense, overgrown scrub oaks. In the absence of ground fuel to effectively carry a fire, mechanical means are used. Mechanical alteration is a short-term management method. The goal of its use is to reach a point where fire is the sole means of managing scrub ecosystems. Mechanical alteration also provides a practical means to control volatile summer fires, but the long-term ecological effects of mechanical clearing remain poorly understood (Woolfenden and Fitzpatrick 1996).

Mechanical treatments include roller-chopping, various tree cutters and shredders (i.e. Brown's, V-blade, K-G blade, Barco mulcher, Hydroax, Temco feller, Kershaw Clear-away etc.), and chain-saw use. Roller-chopping causes the most soil disturbance while manual chainsaw use causes the least. Where possible, soil disturbance should be minimized (Fernald 1989, Myers 1991). However, soil disturbance is a method of producing or maintaining the open sandy patches preferred by scrub-jays. Roller chopping is the least costly method of mechanical treatment. A roller-chopper and bulldozer will be available for use on Half Moon starting in fiscal year 1999-2000. Funds have been and will be allocated specifically for mechanical treatment of scrub areas.

In 1998, prison work crews manually and mechanically cut selected oak trees on a 15 acre site, Potter Bend, occupied by scrub-jays. This site has no burn history and the potential for fire to carry into some of the oak stands is yet unknown. This area is a top priority for a growing-

season burn. Herbicide also remains on option to kill oaks enough to allow fire penetration. Table 2 provides a schedule of mechanical and burn treatments on Half Moon's scrub areas.

Scrub Oak Reforestation - Soils, topography and adjacent vegetation indicate that most of Half Moon's approximately 1200 acres of cleared pastures were historically scrubby flatwoods. About 170 acres of these ruderal sites have been planted with longleaf pine (*P. palustris*) resulting in a stocking ranging from 3-140 trees per acre. In 1994, 35 acres were planted with 7,000 sand live oak tubelings. Despite site preparation with burning and herbicide, survival was less than 20% due to lack of moisture. Sod removal also has been considered at these sites to reduce bahiagrass (*Paspalum notatum*) cover. This would allow the propagation of plants with seeds needing exposed mineral soil to germinate.

Monitoring - Six permanent photographic monitoring sites established in June 1997 have been and will be used to monitor vegetation successional changes and responses to fire. Photos are taken annually at each site in the four cardinal directions; additional photos document plant responses to management practices. Other permanent photo points monitor reforestation sites.

Faunal inventories also will be used to determine the effects of habitat management on Half Moon. Annual scrub-jay censuses help assess the efficacy of scrub management techniques. Scrub-jay recruitment surveys done in mid-summer (July) will contribute to monitoring population health and productivity. In addition, future herptile sampling at 3 scrubby flatwoods sites can be compared with results of sampling conducted in 1998.

Table 1. Florida scrub-jay (*Aphelocoma coerulescens*) territory locations on Half Moon Wildlife Management Area, Sumter County, as of 1997. See scrub-jay location map, Appendix I.

Group No.	Name/ Location	No. Counted in March survey	No. Recruited (July/August)	Total No.	Comments
1	80 ac interior (central)	1	2	4	
2	80 ac East (central)	5	2	5	fire line
3	80 ac West (south)	2	2	4	fire line
4	80 ac South (Ventura)	1	4	6	fire line
5	MCN2-6 Interior (N)	2	0?	2	
6	MCN2-6 Northeast	6	0?	6	fire line
7	MCN2-6 East	3	1	4	fire line
8	MCN2-6 Southeast	1	4	6	fire line
9	MCN2-6 Ventura	1	0?	1	
10	Potter Bend NW	1	0?	1	
11	Potter Bend SE	4	1	4	
12	Old Oxford East	3	1	4	fire line
13	Old Oxford Central	2	0?	2	

Group No.	Name/ Location	No. Counted in March survey	No. Recruited (July/August)	Total No.	Comments
14	Alto Landing	1	0?	1	
	TOTAL	33	17	50	

? - could not relocate bird(s)

Table 2. Time line of scrub management activities on Half Moon Wildlife Management Area, 1997-2010. Mechanical treatments (chop) only applied once. Planned fire frequency is 7 years, however weather, fuel, personnel and equipment conditions will also dictate burn schedules, thus providing a more random burn rotation. See burn unit map, Appendix II, for scrub area locations.

Scrub Area	winter 96-97	winter 97-98	winter 98-99	winter 99-00	summer 2002	winter 02-03
MCN1-2 (Pen S)		burn*				
MCN1-3 (Pen N)[1]					burn	
MCN1-9,10 (Alto)				burn*		
MCN1-11 (P40 S)	burn*					
MCN1-11 (P40 N)				burn*		
MCN2-1 (oak refo)[2]						burn
MCN2-3 (PB S)						burn
MCN2-4 (PB N)				chop/burn		
MCN2-6			burn*			
MCN2-7,8 (Oxf E)[3]					chop/burn	
MCN3-2 (MC nw)[3]					burn	
MCN3-3 (MC sw)			burn*			
MCN3-4 (MC E)		burn*				
MCN3-7 (far NE)				burn		

Scrub Area	winter 96-97	winter 97-98	winter 98-99	winter 99-00	summer 2002	winter 02-03
MCN1-2 (Pen S)		burn*				
	summer 2004	winter 04-05	summer 2005	summer 2006	winter 08-09	summer 2009

[1] burned in winter 95-96

[2] burned in winter 93-94, oaks planted in 1995

[3] burned in winter 94-95

*accomplished

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APPENDIX XIV

Timber Management Assessment

Half Moon Wildlife Management Area

Timber Management Assessment

Prepared By:
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Florida Division of Forestry

January 3, 2000

HISTORY

The land now included in the Half Moon Wildlife Management Area (HMWMA) has changed greatly since European settlement of the area in the early to mid 1800's. Almost all of the native longleaf pine timber was cut for lumber. Only trees too small to cut for timber were left to regenerate the forest. Also left uncut were the slash, loblolly and pond pines that grew in inaccessible wet areas. Seedling slash pine, loblolly pine and pond pine are easily killed by fire. It is likely that lightning induced wildfires frequently burned over most of what is now HMWMA. That is why these three species were primarily confined to wetter sites.

Beginning in the late 1920's, wildfires were aggressively fought and extinguished. Longleaf pine seeds need bare mineral soil to germinate and survive. Burning of accumulated leaf litter normally provides the bare soil. Exclusion of fire from these lands and the subsequent buildup of organic matter on the soil inhibited longleaf pine regeneration. Conversely, fire suppression allowed the other pines to become more firmly established in areas close to their seed source.

Portions of the palmetto flatwoods were cleared of all vegetation and cultivated. Later, those same fields and others were turned into improved pastures for cattle production. From March of 1992 through February of 1998, the Florida Fish and Wildlife Conservation Commission (FWC) planted

170 acres of improved pasture with longleaf pine seedlings. Survival rates have been mixed; however, most have been less than 50%. Presently there are approximately 1,000 acres of open pasture remaining in the HMWMA. Close to 150 acres of these disturbed sites are being mowed to maintain wildlife openings.

The result of all of the above-mentioned activities is a landscape that has scattered stands of pine timber. There is, however, one overstocked slash pine plantation covering approximately 150 acres on the north end of the tract. It needs thinning in the very near future to improve stand vigor and lessen the likelihood of serious insect or disease attack. There are also a few small strands of mixed slash, loblolly and pond pine that either need thinning, sanitation cuts, or group selection harvests and replanting to longleaf pine.

Local resource managers have done an excellent job of identifying and designating burn (prescribed fire) units on HMWMA. However, acreage figures for Florida Natural Area Inventory (FNAI) natural community types as related to their management needs is not currently available. A timber stand description is needed that groups areas within the tract into stands of similar species composition, age, stocking levels, growth and management needs. Information necessary for proper wildlife and ecosystem management is also gathered and compiled in this process. For proper planning and management of the timber resource, this should be completed within the next five years.

RESTORATION AND SILVICULTURAL MANAGEMENT GUIDELINES

OBJECTIVES

The primary goal of HMWMA is to provide public outdoor recreational opportunities while conserving and protecting natural and historic resources. As part of this goal, the reestablishment of native ecosystems is a high priority. Timber management is a valuable tool in the restoration and maintenance of forested ecosystems.

Efforts will be made to reestablish native species at densities and compositions believed to have existed prior to site alteration. Historically, longleaf was the most prevalent pine species in many areas due to the frequency of wildfires. Planting of longleaf pine seedlings in existing openings will help reintroduce this valuable species to these disturbed mesic flatland communities. Likewise, group selection cuts in offsite slash/loblolly/pond pine stands will provide opportunities to reestablish longleaf pine along with the added benefit of creating wildlife openings.

Frequent, low to medium intensity fires must be used to maintain these communities in a healthy condition. In areas not subject to prolonged flooding, longleaf is the most desirable of the pine tree species to be planted to assure a vigorous ecosystem. These hardy pine seedlings can be prescribe burned within one to two years after planting without suffering severe losses. This ability to withstand fire at a very young age differentiates longleaf from other pine species. Slash and loblolly pine regeneration must be protected from fire for up to10 years or more depending on fuel loading. This delay in reintroducing fire can have a negative impact on fire dependent plants and animals from the ecosystem. Planting longleaf pine seedlings helps minimize disruption of the prescribed fire cycle.

Natural regeneration of pine stands will be encouraged whenever possible. However, an inadequate seed source will likely require artificial regeneration in most instances. Longleaf pine seedlings occur naturally in dense stands that are thinned out over a period of years by fire or competition for growing space. To simulate this process, longleaf pine seedlings are densely planted at 600 to 726 trees per acre and later thinned out through timber harvests when they get too crowded. Planting them in improved pastures has the added benefit of helping to shade out the nonnative grasses. When the trees are thinned out, native ground cover can be more easily reestablished. Longleaf pine seedlings from a nearby Withlacoochee State Forest seed source are available from the Division of Forestry's Andrews Nursery in Chiefland.

EXISTING CONDITIONS AND MANAGEMENT PRESCRIPTIONS

Exact acreage figures for each forest or community type are unavailable at this time. A comprehensive timber stand description is needed to provide these numbers. The following are general observations and management options for various stands observed on HMWMA.

Improved Pastures - Most of the improved pastures were created in former mesic or scrubby flatwoods communities. Small portions of these pasturelands are being mowed to maintain them as wildlife openings. This leaves many acres of non-native grasses that will not be perpetuated. Some of these pastures have oaks and wax myrtles encroaching. Other blocks are relatively open.

Longleaf pine seedlings should be planted in areas between wildlife openings and along roads as a visual screen (with breaks for wildlife viewing). They should also be planted in narrow, meandering strips on the edges of wildlife openings adjacent to existing stands of other pines to reintroduce longleaf to those ecosystems. Blocks with previously established oaks may have pine seedlings planted in the larger openings where competition for sunlight will not be a problem.

Stands with scrub oak, wax myrtle and saw palmetto encroachment that are not going to be managed for scrub jay habitat may need a single pass with a straight roller-drum chopper. This, followed by a growing season prescribed burn, will usually allow longleaf pine seedlings to be successfully planted.

To successfully plant longleaf pine seedlings in improved pasture, the sod must be removed or killed in a zone wide enough to eliminate competition for soil moisture. Past planting failures were likely due to inadequate site preparation combined with droughty soil moisture conditions. Containerized (tubeling) seedlings may be substituted for bareroot in any of the following prescriptions. Using tubelings extends the planting season to include July and August as well as December and January. However, the cost is approximately two times as much as bareroot seedlings. Also, contract hand planting is difficult to arrange and up to twice as expensive as machine planting.

Restoration Alternatives

- Allow strips (18” to 36” wide by 12' apart) of sod to be harvested by a commercial operator. Plant bareroot or containerized longleaf pine seedlings at approximately 5' X 12' spacing (726 trees per acre). It is likely that a sod cutter would require the grass to be mowed, fertilized and possibly herbicided for two years prior to cutting. This method would delay the planting of seedlings (planting may be difficult to accomplish anyway without at least 18 to 24 months of lead-time). Killing of the woody brush by herbicide application and mowing would have a negative impact on wildlife cover over the short term. However, the sale of sod should produce some income to be used for other management needs, ensure that the seedling and planting expenses are not wasted and allow native species to be more quickly established. Research should be done as to the ability of sod cutting machines to cut a curved swath (will be necessary if seedlings are to be planted in a meandering fashion). Approximate cost - $100 per acre (no herbicide)

- Herbicide meandering strips approximately 24” wide by 12' apart using Roundup or other grass killer. Plant as above. This site prep method can be expensive (currently up to $50 per acre), but it helps insure greater survival of expensive seedlings than with no site preparation. Approximate total cost - $150 per acre.

- Scalp meandering strips approximately 24” wide by 12’ apart. Scarring of the land can be kept to a minimum if the scalper is set to a depth of no more than 2” to 3”. This will retard the sod, but not disturb too much soil. Plant as above. Scalping is the preferred method of tree planting where depth of sod, soil moisture and vegetative competition is a concern. Approximate total cost - $150 per acre.

- Care should be exercised to maintain cattle at reasonable levels until stands are well established. It would be best to exclude all cows until the seedlings are in the grass stage. Some cattle rubbing damage has been observed in advanced seedling stands. However, the current low cow-stocking rate seems to be keeping breakage and bending to acceptable levels. Consult the Natural Resource Conservation Service (NRCS) for recommendations.

- The number of surviving seedlings should be determined after the first and second growing seasons. If survival rates are less than 50%, a decision will have to be made whether re-planting is necessary. Is it better to fill in the holes in the stand through supplemental planting or to live with lower tree densities through the first thinning? The answer will depend on the total number of seedlings surviving and their spatial arrangement. Large holes in a stand lend themselves to replanting.

Thinning Alternatives

To maintain healthy, vigorously growing trees and assuming 50% or greater survival, the planted longleaf pines should be thinned to 70 - 80 sq. ft. of basal area per acre (BA) in 15 to 25 years. The first thinning should be initiated when the live crown in a majority of dominant and co-dominant trees has been reduced to approximately 1/3 of their total height. This will help insure a healthy stand of trees, open up the canopy, and allow sunlight to reach the forest floor. The added sunlight and disturbance promote wildlife forage production. Stands should continue to be thinned back to 70 - 80 sq. ft. BA each time they reach 100 sq. ft. or more.

Pine Stands - Most of the pine stands average less than 30 square feet of basal area per acre (sq. ft. BA). They consist of varying mixtures of slash, loblolly and pond pines. Due to past harvesting

practices and fire exclusion, these species have encroached into mesic flatland communities formerly predominated by longleaf pine. Over the long term, none of these species will successfully regenerate itself with the reintroduction of a three to five-year fire cycle. In these stands, it is desirable to maintain some older growth pine for wildlife and aesthetic reasons. However, it is also necessary to reintroduce longleaf pine into the fire dependent communities.

Restoration Alternatives

- Upland stands of mixed slash, loblolly, and pond pines should be burned at least once during the dormant season prior to receiving any other treatment. Next, a thinning from below is recommended to remove most of the loblolly pine; all of the pond pine; and any diseased, suppressed, overcrowded and overtopped slash pine. Residual longleaf pine should be left. Harvesting all trees (except longleaf) on up to 25% of the remaining stand should create scattered one to five-acre holes in the stand. Allow the stand to sit through at least one summer growing season following the harvest. A single pass with a roller drum chopper may be necessary to reduce the saw palmetto competition. Prescribe burn the tract to remove logging slash and help reduce vegetative competition. Meander plant bareroot longleaf pine seedlings (as above) using a combination scalper/rough-woods tree planter in December or January. Use prescribed fire again as soon as a majority of the seedlings are in the grass stage. The next burn should be undertaken when the majority of the regeneration is waist high. Use extreme caution when conducting this burn to prevent excessive mortality. Make sure there is adequate soil moisture to the seedlings protect fine roots. If fuel loads have built up to heavy levels, a cool night burn may be needed to safely reduce them. Once the longleaf are at least 10' tall, resume a normal three to five year prescribed fire regime.

  This type of harvest operation will create wildlife openings, maintain older growth pine timber, and provide for reintroduction of longleaf pine into the ecosystem. Stands

should be revisited for thinning and cutting of openings every 10 to 20 years until most of the area has been regenerated with longleaf pine. Approximate establishment cost: roller drum chopping $50/acre : rough woods planter - $50/acre : seedlings - $50/acre or a total of $150 per acre.

- An alternative to creating scattered holes in these understocked areas is to harvest most of the existing pine (with the exception of longleaf) in each stand at one time. Leave 10 to 20% of primarily slash and longleaf pine in islands for height diversity. Then, replant with longleaf seedlings as stated above. This option would speed up return of longleaf to the ecosystem. It may be the only economically feasible solution in severely understocked stands. However, it would limit the ability to create wildlife openings at regular intervals.

- Some stands have less than 10 square feet BA of pine timber per acre. These stands need to be prescribed burned at least twice. In areas of dense understory, a single pass with a straight roller drum chopper may be necessary a month or two prior to the last burn. The final prescribed burn should be conducted in the lightning season if the site was not chopped. Then, meander plant longleaf pine seedlings using a rough-woods scalper/planter as above.

Thinning Alternatives

Lower initial planting densities and poorer survival rates will result in fewer trees per acre in rough woods planting sites. Therefore, stocking levels will not be as high as pasture plantings. Larger tree diameters will be attained sooner, but crown closure and loss will not occur as quickly. Therefore, these stands will probably not require thinning until 20 to 25 years of age. Again, the first thinning is needed when the live

crown in a majority of dominant and co-dominant trees has been reduced to approximately 1/3 of their total height. This will help ensure a healthy stand of trees, open up the canopy, and allow sunlight to reach the forest floor, which promotes wildlife forage.

Slash Pine Plantation – The only stand of planted pine on HMWMA is an approximately 150-acre block that was purchased after the original acquisition. It was planted on a heavily prepared site that originally would have had longleaf pine growing on it. The ultimate goal should be to reestablish longleaf as the predominant tree species in this stand.

The slash pine is approximately 30 years old, has never been thinned, and has 120 sq. ft. BA or more. As a result, the percent of live crown in dominant and codominant trees has been reduced to less than 25% and diameter growth has slowed down. Thinning stands of slash pine that have already lost their active growth does not usually lead to improved performance. However, reducing the BA to 60 – 70 sq. ft. per acre, whenever it reaches 100 sq. ft. or more, will maintain the health of the stand until 80 to 120 years of age.

Thinning Schedule – A series of group selection cuts should be used to reestablish longleaf in this stand while avoiding a large clearcut. To accomplish the group selection harvest, on no more than 25% of the 150 acres, cut all slash pine trees in two to five acre irregular shaped blocks. These openings in the canopy must be at least two chains (132 feet) wide to provide adequate sunlight for longleaf seedling growth. In the rest of the stand, reduce the BA to 60 to 70 sq. ft. per acre first by removing all diseased and suppressed trees. Then, thin the remaining dominant and codominant trees to alleviate crown overcrowding. Repeat this operation once the BA exceeds 100 sq. ft. per acre. At the current rate of growth, this may dictate a 15 to 20 year or more cutting cycle.

Restoration - Randomly plant 600 to 726 bareroot or containerized longleaf seedlings per acre (as above) in the group selection openings. Follow the prescribed burning schedule as previously outlined for longleaf plantings. By the time the remnant stand of slash pine is ready to be thinned again, it is likely that the young longleaf will also need thinning. This should take 15 to 20 years. At that time, new group selection openings should be cut and replanted with longleaf seedlings. Replanting may no longer be necessary after the third or fourth cut. Depending on the cone producing ability of the original longleaf plantings, they should be able to naturally reseed the openings. As soon as they can produce a seed crop, the number of openings should be reduced so that no more than five to ten percent of the total stand acreage is cleared per cutting cycle. This will ensure a steady flow of mixed timber products and new wildlife openings forever. The result of this type of harvest will be an uneven-aged stand of mixed longleaf and slash pine that tolerates prescribed fire well. Wildlife will benefit from the periodic cutting of openings in the canopy and the ability to maintain a frequent burning schedule.

Mixed Premerchantable, Pulpwood, and Small Sawtimber Stands - Although few of these stands exist on HMWMA at the present, the ones that are there should not be ignored. Stands with basal area exceeding 100 square feet per acre are scattered across the area. They often occur in strands adjacent to flatwoods/prairie lakes or improved pastures. Most are slash pine, loblolly pine, or a combination of both.

Thinning Schedule - These stands should be thinned to approximately 60 sq. ft. of BA. Remove diseased, deformed, suppressed, and overcrowded trees to achieve the proper stocking. It is likely that these stands will have to be sold together to make them attractive on the timber market. Stands will probably need revisiting and additional thinning at 10 to 20 year intervals.

Thinning these stands will produce current revenue and ensure future income to be used for other resource management objectives. At the same time, the heavy equipment used in

logging helps reduce the understory rough. This disturbance makes prescribed burning easier and safer. It also improves wildlife forage production.

Scrubby Flatwoods - A few stands, comprising a total of 550 acres, are being managed for scrub-jays. These areas have very scattered longleaf pine with BA of less than 10 sq. ft. To minimize raptor perches, the overstory pines may be removed as necessary and not replanted.

Salvage Sales - On occasion, small volumes of wood may need to be removed due to fire, windstorm, insect or other damage. The decision whether or not to harvest the affected timber will depend on the threat to the surrounding stands and the volume/value of the trees involved. For example, small, isolated lightning-strike beetle kills are a natural part of a healthy ecosystem and normally would not be cut. However, if a drought caused the insect infestation to spread, the infected trees and a buffer zone might have to be removed.

SUMMARY

Saleable timber is a byproduct of good ecosystem management. Carefully designed timber harvests create openings in the tree canopy allowing sunlight to reach the forest floor, promoting herbaceous growth. These clearings and their ecotones are favorite spots used by wildlife for feeding, resting, mating, nesting and rearing of offspring. Mechanical equipment involved in timber harvests helps reduce dense understory vegetation such as palmetto, gallberry and undesirable hardwoods. This fuel reduction makes the introduction of prescribed fire easier, safer and more effective. Income from forest product sales may be used for land management and resource restoration needs as general revenue funds become more difficult to secure.

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APPENDIX XV

NRCS Conservation Plan of Operation

CONSERVATION PLAN COVER PAGE

Client: FGFWFC FGFWFC
Assisted By: Gene A. Pultz

Farm	ACRES	LAND UNIT NAME	OWNER NAME
4155	9398.0	Kalt moon WMA	

TOTAL 9398.0 ACRES

Half Moon Wildlife Management Area
(Sumter County, Florida)

Field #	Land Cover Classification	Acreage
1	Pasture	1,250
2	Swamp	855
3	Open water	109
4	Marsh	1,015
5	Flatwoods	6,219

~~25~~ ↑
50 acres
over
total

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
Kissimmee

CONSERVATION PLAN

Client: FGFWFC — FGFWFC
Assisted By: Gene A. Fults

LAND UNITS		PLANNED			APPLIED		
FARM	FIELD	AMOUNT	MONTH	YEAR	AMOUNT	DATE	PLANNED CONSERVATION TREATMENT
							wma
8r44	1, 2, 3, 4, 5	9398.0Ac					This system of managment tools will protect natural habitats, surface water, and successional plant communities.
8r44	1	5280.0ft	10	1998			ACCESS ROAD
	2	5280.0ft	10	1998			Build a designated route or constructed travelway to be used
	3	5280.0ft	10	1998			by vehicles necessary for management of the operation.
	4	5280.0ft	10	1998			
	5	5280.0ft	10	1998			
8r44	1	1200.0ac	10	1999			BRUSH MANAGEMENT
	4	1015.0ac	10	1999			Will control or manipulate brush stands so that the resulting
	5	6219.0ac	10	1999			plant community will achieve the conservation objectives.
							(see job sheet for standards and specifications)
8r44	1	1200.0ac	06	1998			Deferred grazing
	4	1015.0ac	06	1999			Will remove all livestock from a field for a prescribed
	5	6219.0ac	06	2000			period of time so that the key forage species can maintain
							or gain vigor. Defer for 90 days of the active growing
							season following brush control. Defer for 30 days of the
							growing season following fire.
8r44	1	60000.0ft	10	1997			FENCE
	2	42750.0ft	10	1998			Will maintain a suitable permanent structure to regulate
	3	5450.0ft	10	1998			access to or from an area. Planned fences will be
	4	50750.0ft	10	1998			constructed according to NRCS standards and specifications.
	5	310950.0ft	10	1997			
8r44	1	222000.0ft	09	1997			FIREBREAK
	5	993999.9ft	09	1997			A constructed, natural, or cultural barrier will be used to
							control the location of a fire by stopping its movement
							across that barrier. The constructed barrier will be a
							minimum six foot wide strip of bare soil.
8r44	1	2.0no	10	1999			FISHPOND MANAGEMENT
	5	3.0no	10	1999			Improve or maintain fish production by creating a favorable
							habitat for desired species.
8r44	1	2.0no	10	1998			POND
	5	2.0no	10	1998			Will maintain a watering source by excavating a pit or dugout
							to provide water for livestock, wildlife, recreation and
							other related uses. Planned ponds will be constructed
							according to NRCS standards and specifications.
8r44	1	1200.0ac	10	1997			PRESCRIBED BURNING
	4	1015.0ac	10	1998			Will apply fire to an area so that it is confined to that

APPENDIX XVI

CARL Management Summary

Half Moon WMA Management Summary.
From the 1989 Annual Report of the Conservation and Recreation Lands Program, page 76.

Section 259.032 (10) of the Florida Statutes requires that the management prospectus for each tract shall be available to the public for 30 days prior to the public hearing. No prospectus was required or prepared when the Half Moon WMA was purchased. The following management summary is presented in lieu of a management prospectus.

Management Summary

The Carlton Half Moon Ranch consists of approximately 8,000 acres located in Sumter County along the Withlacoochee River. The ranch presently is managed for cattle and wildlife and includes over 20 miles of cross fencing and cattle pens, an equipment barn, and several wells.

The property should be managed by the Game and Fresh Water Fish Commission as a wildlife management area and for protection of the Withlacoochee River and Gum Slough, in cooperation with the Division of Forestry of the Department of Agriculture and Consumer Services, the Division of Historical Resources of the Department of State, and the Southwest Florida Water Management District (which has previously acquired the 3,000 acre floodplain portion of the project). Although the primary use of the property in the past has been hunting, the Carlton Half Moon Ranch also offers excellent opportunities for a variety of outdoor recreational activities including hiking, camping, wildlife photography, fishing, and nature study. The Withlacoochee River and Gum Slough offer good fishing and canoeing, and Gum Springs could offer good swimming opportunity. The existing remains of logging trams extending into and along the river floodplain could provide good hiking trails for wildlife viewing and nature interpretation.

Because of existing improvements to the property relative to fencing, access is already largely controlled, start-up costs for management of the property should be modest. The present road system would need some improvement, and some timber management practices and reforestation would be necessary to reestablish some native habitats.