Crystal River Preserve State Park

UNIT MANAGEMENT PLAN

APPROVED

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMETAL PROTECTION
Division of Recreation and Parks

October 15, 2004

Crystal River Preserve State Park

Ten-Year Land Management Plan

Photo by Jeffrey Q. Smith

Prepared by
Florida Department of Environmental Protection
Office of Coastal and Aquatic Managed Areas
in cooperation with the
Division of Recreation and Parks

For the period
October 2004
through
October 2014

Division of Recreation and Parks
Mission Statement:

To provide resource-based recreation while preserving, restoring and interpreting natural and cultural resources.

Florida Department of Environmental Protection

Division of Recreation and Parks
Office of Park Planning
3900 Commonwealth Blvd., Mail Station 525
Tallahassee, FL 32399
(850) 245-3051

Department of Environmental Protection

Jeb Bush
Governor

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

Colleen M. Castille
Secretary

December 7, 2004

Ms. Ellen Stere
Coastal and Aquatic Managed Areas
3900 Commonwealth Blvd., M.S. 235
Tallahassee, Florida 32399

Re: Crystal River Preserve State Park **Lease #4084**

Ms. Stere:

On **October 15, 2004**, the Acquisition and Restoration Council recommended approval of the **Crystal River Preserve State Park** management plan.

On **December 7, 2004**, the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, approved the management plan for the **Crystal River Preserve State Park**. Pursuant to Section 253.034, Florida Statutes, and Chapter 18-2, Florida Administrative Code this plan's ten-year update will be due on **December 7, 2014**.

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

Sincerely,

Paula L. Allen
Office of Environmental Services
Division of State Lands
Department of Environmental Protection

cc: Ms. BryAnne White

Land Management Plan Executive Summary

Land Agency: Florida Department of Environmental Protection / Division of Recreation and Parks

Common Name of Property: Crystal River Preserve State Park

Location: Citrus County, Florida

Acreage total: 27,295.05 (under lease #4084)

Natural Communities:

Land Cover Classification	Acreage
Estuarine Tidal Marsh	16,903
Hydric Hammock	3,734
Marsh (Prairie) Hammock	2,824
Estuarine Tidal Swamp	1,747
Mesic Flatwoods	1,166
Scrubby Flatwoods	946
Basin Marsh	418
Floodplain Swamp	389
Basin Swamp	348
Freshwater Tidal Swamp	299
Scrub	292
Upland Mixed Forest	237
Wet Prairie	190
Floodplain Forest	143
Ruderal	117
Borrow pits	79
Spoil	57
Sandhill	41
Dome Swamp	31
Developed	5
Total GIS Acreage	**27,295.05**

Leases: Lease #4084
Designated Use: Single use for conservation and public outdoor recreation
Management Responsibilities: Agency-DEP, Division of Recreation and Parks - Lead, Lessee (state preserve, buffer for aquatic preserve)
Designated Land Use: Preserve State Park
Sublease (s): 4084-01 (sublease to Gulf Archaeological Research Institute)
Contract (s): none
Encumbrances: none
Type Acquisition: Environmentally Endangered lands (EEL), Conservation and Recreation Lands (CARL), Preservation 200 (P-2000); fee simple
Unique Features: scrub, scrubby flatwoods, extensive estuarine tidal marsh, freshwater tidal swamp, 13 listed plant species, 52 listed animal species
Archeological/Historical: 236 known historic or cultural sites
Management Needs: timber thinning and management, prescribed fire, exotics removal, hydrologic restoration, water quality protection, protection from urban setting.
Acquisition Needs/Acreage: 2,065 acres remaining to be acquired based on 2003 year Florida Forever Five Year Plan; 1,149 additional acres outside of current project boundaries identified by preserve staff
Surplus Lands/Acreage: none
Public Involvement: advisory group meeting and public hearing

State Lands Checklist

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, 55
3. The legal description and acreage of the property.	Appendix 1
4. The degree of title interest held by the Board, including reservations and encumbrances such as leases.	1
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.	1
7. Proximity of property to other significant State, local, or federal land or water resources.	2, 11, 13
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.	13
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;	18
B. Archaeological and historical resources;	51, App. 11
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;	13, 18
D. Fish and wildlife and their habitat;	35-45
E. State and federally listed endangered or threatened species and their habitat;	43
F. Beaches and dunes;	N/A
G. Swamps, marshes and other wetlands;	35-41
H. Mineral resources, such as oil, gas and phosphate;	48
I. Unique natural features, such as coral reefs, natural springs, caverns, large sinkholes, virgin timber stands, scenic vistas, and natural rivers and streams; and	18, 52
J. Outstanding native landscapes containing relatively unaltered flora, fauna, and geological conditions.	35-41
10. A description of actions the agency plans, to locate and identify unknown resources such as surveys of unknown archaeological and historical resources.	36, 51, 78, 81
11. The identification of resources on the property that are listed in the Natural Areas Inventory.	Appendix 7
12. A description of past uses, including any unauthorized uses of the property.	53
13. A detailed description of existing and planned use(s) of the property.	53-57
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.	65
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.	57
16. A description of management needs and problems for the property.	70-93
17. Identification of adjacent land uses that conflict with the planned use of the property, if any.	58
18. A description of legislative or executive directives that constrain the use of such property.	1, 67
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.	2, 54, 57
20. An assessment as to whether the property, or any portion, should be declared surplus.	58
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.	58, 63, App. 12

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, 51, 76, 90, App. 14
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.	14, Appendix 4
Additional Requirements—Per Trustees	
24. Letter of Compliance of the management plan with the Local Government Comprehensive Plan.	Appendix 15
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 10 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.	70-84
26. Provide for the conservation of soil and water resources and for the control and prevention of soil erosion.	70-71
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.	14
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.	65
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.	89
❖ **253.034 (9)—**The following additional uses of conservation lands acquired pursuant to the Florida Forever program and other state-funded conservation land purchase programs shall be authorized, upon a finding by the board of trustees, if they meet the criteria specified in paragraphs (a)-(e): water resource development projects, water supply development projects, stormwater management projects, linear facilities, and sustainable agriculture and forestry. Such additional uses are authorized where: **(a)** Not inconsistent with the management plan for such lands; **(b)** Compatible with the natural ecosystem and resource values of such lands; **(c)** The proposed use is appropriately located on such lands and where due consideration is given to the use of other available lands; **(d)** The using entity reasonably compensates the titleholder for such use based upon an appropriate measure of value; and **(e)** The use is consistent with the public interest. ❖ **This is not a land management plan requirement; however, it should be considered when developing a LMP.**	
253.036 Forest Management. —	
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.	Appendix 9
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:	
30. Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group.	Appendix 4
31. The advisory group shall conduct at least one public hearing within the county in which the parcel or project is located.	Appendix 4
32. 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.	Appendix 4

33. 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.	Appendix 4
34. 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.	5, 14, 55-57
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.	57-85
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.	57-85
D. A priority schedule for conducting management activities, based on the purposes for which the lands were acquired.	Appendix 13
E. A cost estimate for conducting priority management activities, to include recommendations for cost-effective methods of accomplishing those activities.	88
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.	88
35. A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	54, 57, 85-87
259.036 Management Review Teams.—	
36. The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan.	92

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List of Acronyms

ARC-	Acquisition and Restoration Council
BAR-	Bureau of Archaeological Research
BOT-	Board of Trustees of the Internal Improvement Trust Fund
CAMA-	Office of Coastal and Aquatic Managed Areas
CARL-	Conservation and Recreation Lands
DHR-	Division of Historical Resources
DOF-	Florida Division of Forestry
DOS-	Department of State
DRP-	Division of Recreation and Parks
EEL-	Environmentally Endangered Lands program
FAC-	Florida Administrative Code
DEP-	Florida Department of Environmental Protection
FLEPPC-	Florida Exotic Pest Plant Council
FNAI-	Florida Natural Areas Inventory
FWC-	Florida Fish and Wildlife Conservation Commission
FS-	Florida Statutes
GARI-	Gulf Archaeology Research Institute
OGT-	Office of Greenways and Trails
OFW-	Outstanding Florida Waters
P-2000-	Preservation 2000
SWFWMD-	Southwest Florida Water Management District
USFWS-	United States Fish and Wildlife Service

I. Introduction

Crystal River Preserve State Park is located in Citrus County. The City of Crystal River lies near the central part of the preserve and contains a portion of the preserve within its city limits. Access to the preserve is from several roads including; US Hwy 19, Fort Island Trail, Ozello Road, Old Tallahassee Road, State Park Street, and Sailboat Avenue.

The State of Florida acquired the Crystal River Preserve State Park to conserve the natural landscape of this coast, protect the water quality of the spring runs and estuaries where endangered manatees congregate, preserve natural lands that link with conservation lands to the south, and provide scenic areas in which the public can enjoy fishing, hiking, or learning about the natural world of this coast. The preserve is 27,295.05 acres, with approximately 5,426.26 upland and 21,868.79 wetland acres.

On December 5, 1984, the Board of Trustees of the Internal Improvement Trust Fund (BOT) obtained fee simple title to the property known as the Crystal River State Reserve, and management authority was given to the Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP). The project was purchased with funds from EEL, CARL, P-2000, and Florida Forever. The property was later transferred to the Division of State Lands and renamed the Crystal River State Buffer Preserve with management authority vested with the DEP, Office of Coastal and Aquatic Managed Areas (CAMA). On January 1, 2004, management authority was transferred back to the DRP, and the property was renamed as the Crystal River Preserve State Park. CAMA and DRP staff have collaborated on necessary modifications to this management plan, and will continue close coordination of management activities on the new preserve state park in the future. Currently, the DRP manages these lands under Lease #4084, dated March 7, 1996. The lease is for fifty (50) years, and expires on March 6, 2046 (Appendix 1).

This 10-year land management plan is the update to the Crystal River State Buffer Preserve management plan approved in 1997.

Purpose and Scope of Plan

This management plan for Crystal River Preserve State Park describes its setting, natural resources, and the intended management. Acquired through the EEL, CARL, P-2000, and Florida Forever programs, the general management and use of the land are directed by the statutes and rules of those programs. Additionally, management is guided by the purpose and intended use of the land described in the land acquisition project selection process. Other statutes and rules also control the use of the land.

Conservation and compatible resource-based recreation is the designated single use of the property. The property is to be managed as a buffer to the adjacent aquatic preserve, along with other related uses necessary for and compatible with the accomplishment of this purpose.

The mission of the DRP is to provide resource-based recreation while preserving, restoring and interpreting natural and cultural resources. In the management of the Crystal River Preserve State Park, preservation and enhancement of natural conditions is all important. Resource considerations are given priority over user considerations and development is restricted to the minimum necessary for ensuring resource protection and maintenance, limited access, user safety and appropriate interpretation. Permitted public uses are of a passive nature, related to the aesthetic, educational and appropriate recreational enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Interpretive program emphasis is placed on the natural and cultural attributes of the preserve.

This management plan is submitted for review to the BOT through the Department of Environmental Protection, Division of State Lands (DSL). It is intended to comply with paragraph 7 of Lease # 4084 between the BOT and DEP/DRP (Appendix 1); Chapters 253 and 259, Florida Statutes (F.S.); and Chapters 18-2 and 16 D-2 (Appendix

2), Florida Administrative Code (FAC). The plan is intended to be consistent with the State Land Management Plan. The format and content of this plan for Crystal River Preserve State Park are in accordance with the Acquisition and Restoration Council recommendations for management plans and the model plan outline provided by the staff of DSL. When approved, this plan will replace the current plan approved on August 31, 1997.

All development and resource alteration encompassed in this plan are subject to the granting of appropriate permits, easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state, or federal agencies.

Location

Crystal River Preserve State Park is located in Citrus County (Map #1). The headquarters for the preserve may be found at 3266 N. Sailboat Ave., Crystal River, three miles west of US 19. The preserve stretches from around the community of Homosassa in the south to the cities of Inglis and Yankeetown in Levy County to the north, and overlaps with a section of the City of Crystal River in the central part of the preserve. Other nearby cities include Inverness, the Citrus County seat, and Dunnellon in Marion County.

As the Withlacoochee River nears the coast the preserve borders portions of the southern bank. The Crystal River and Homosassa River run through the preserve, with the Gulf of Mexico as its western boundary. County roads 44W (Fort Island Trail) and 494 (Ozello Trail) run in roughly an east-west direction through the preserve. The preserve may be accessed at two points along the road leading to the headquarters, two points along Fort Island Trail, one point on US 19, and one point along Old Tallahassee Road. The main office also may be accessed by boat as it sits on the Crystal River and provides docking space.

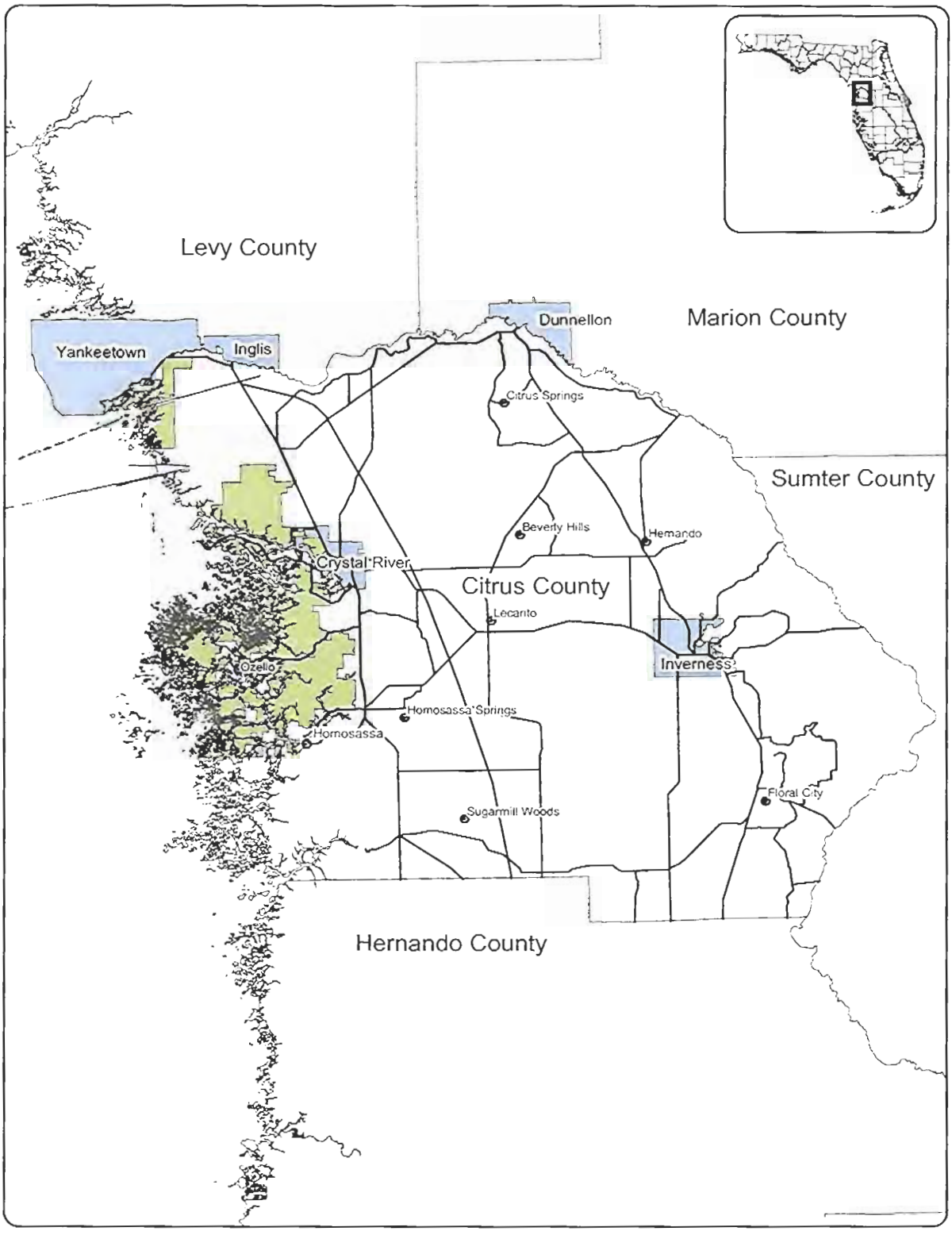
Regional Significance

With most major acquisitions complete, the preserve serves as an important link in a chain of managed areas extending from Hernando County to the south to the Cross Florida Greenway to the north. These include the Chassahowitzka Swamp (SWFWMD), the Chassahowitzka Wildlife Management Area (FFWC), the Chassahowitzka National Wildlife Refuge (USFWS), Withlacoochee State Forest (DOF), the Homosassa Springs Wildlife State Park, the St. Martins Marsh Aquatic Preserve (DEP), the Crystal River Archaeological State Park (DEP), the Crystal River National Wildlife Refuge (USFWS), and the Cross Florida Greenway (DEP). Although not physically connected by a land bridge, the Big Bend Seagrasses Aquatic Preserve and numerous other managed areas begin in Levy County and continue north through the Big Bend region. In Levy County, these include the Waccasassa Bay Preserve State Park (DEP), the Cedar Key Scrub State Reserve (DEP), the Cedar Keys National Wildlife Refuge (USFWS), and the Lower Suwannee National Wildlife Refuge (USFWS).

While providing a buffer to the St. Martins Marsh Aquatic Preserve, the preserve also provides habitat for several listed plant and animal species. It encompasses a variety of habitat types, which endow the preserve with remarkable biodiversity. Environmental education has become a cornerstone of the preserve that thousands have been able to participate in and enjoy. Abundant recreational opportunities exist on the preserve that include hiking, biking, fishing and bird watching. Over the last five years public awareness of the Crystal River Preserve State Park has increased and the preserve has become a place that many citizens of Citrus County enjoy again and again, and has also become a travel destination for those from other counties and states. There are also tremendous opportunities for scientific research by universities and other academic organizations on the preserve.

Florida Fish and Wildlife Conservation Commission: Strategic Habitat Conservation Areas / Regional Hotspots (The following information was taken from the publication “Closing the Gaps in Florida’s Wildlife Habitat Conservation System”, produced by the Florida Game and Fresh Water Fish Commission, now known as the Florida Fish and Wildlife Conservation Commission, in 1994.)

Map #1: Location of the Crystal River Preserve State Park



The Crystal River Preserve State Park is within a Strategic Habitat Conservation Area (SHCA). Detailed habitat maps have been developed for 40 taxa of wildlife based on known occurrences, habitat requirements, and accompanying information on land cover. Conservation recommendations have been made for each of the 40 species. By combining the habitat maps, a composite map has been created which shows Strategic Habitat Conservation Areas (SHCAs) for all species, species groups, and natural communities for which recommendations were developed. The SHCAs are essential to enhancing the long-term security of many plants, animals, and natural communities that constitute essential components of Florida's natural diversity.

Although the SHCAs are essential to sustaining many rare plants, animals, and natural communities, they do not include some natural areas that might warrant conservation based on their importance to local populations of rare species or other natural resources. "Hot spot" maps of biological resources were created for each region by overlaying the habitat maps and subdividing the composite map into 3 broader class categories which are based on the number of focal species that would likely find appropriate habitat conditions in the area. Class 1 lands are areas where habitat conditions for 3-4 focal species are likely to occur. Class 2 is for 5-6 focal species. Class 3 is for 7+ species. The Crystal River Preserve State Park is designated as a Class 1 and 2 area.

Land Acquisition

Purpose

The preserve was acquired under the CARL and Florida Forever programs under a variety of project names, the most recent being the Florida Springs Coastal Greenway project (see "History"). According to the "Florida Forever Five-year Plan, 2003", the purpose for state acquisition of the Florida Springs Coastal Greenway (of which Crystal River Preserve State Park is a portion) is to conserve the natural landscape of this coast, protecting the water quality of the spring runs and estuaries where endangered manatees congregate, preserving natural lands that link with conservation lands to the south, and providing scenic areas in which the public can enjoy fishing, hiking, or learning about the natural world of this coast. The Florida Forever Plan originally designated this project as a buffer preserve to protect the waters of the St. Martins Marsh Aquatic Preserve. Map #2 denotes the boundary of the current preserve, and Map #3 shows the land acquisition boundary of the Florida Springs Coastal Greenway project.

Crystal River Preserve State Park is not an aquatic preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes), as amended. This preserve is within and adjacent to the St. Martins Marsh Aquatic Preserve. Waters within the preserve have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302 Florida Administrative Code. Surface waters in this unit are also classified as Class II waters by DEP.

Crystal River Preserve State Park is not within an Area of Critical State Concern as defined in section 380.05, Florida Statutes. It is not under study for such designation.

History

First purchases and donations of land occurred in 1974 under the EEL program. This property was first placed on the CARL land acquisition list in 1982 under several different projects named Crystal River II, Crystal Cove, and Crystal River State Reserve. Land was first purchased under the CARL program in 1983. These three projects were later combined to form the Crystal River CARL Project, which was subsequently combined with the St. Martins River CARL project and the Homosassa Reserve CARL Project to form the current Florida Springs Coastal Greenway Florida Forever Project. In December 2003 the Florida Springs Coastal Greenway project moved from Category B to Category A on the 2004 Florida Forever list and is currently eligible for acquisition.

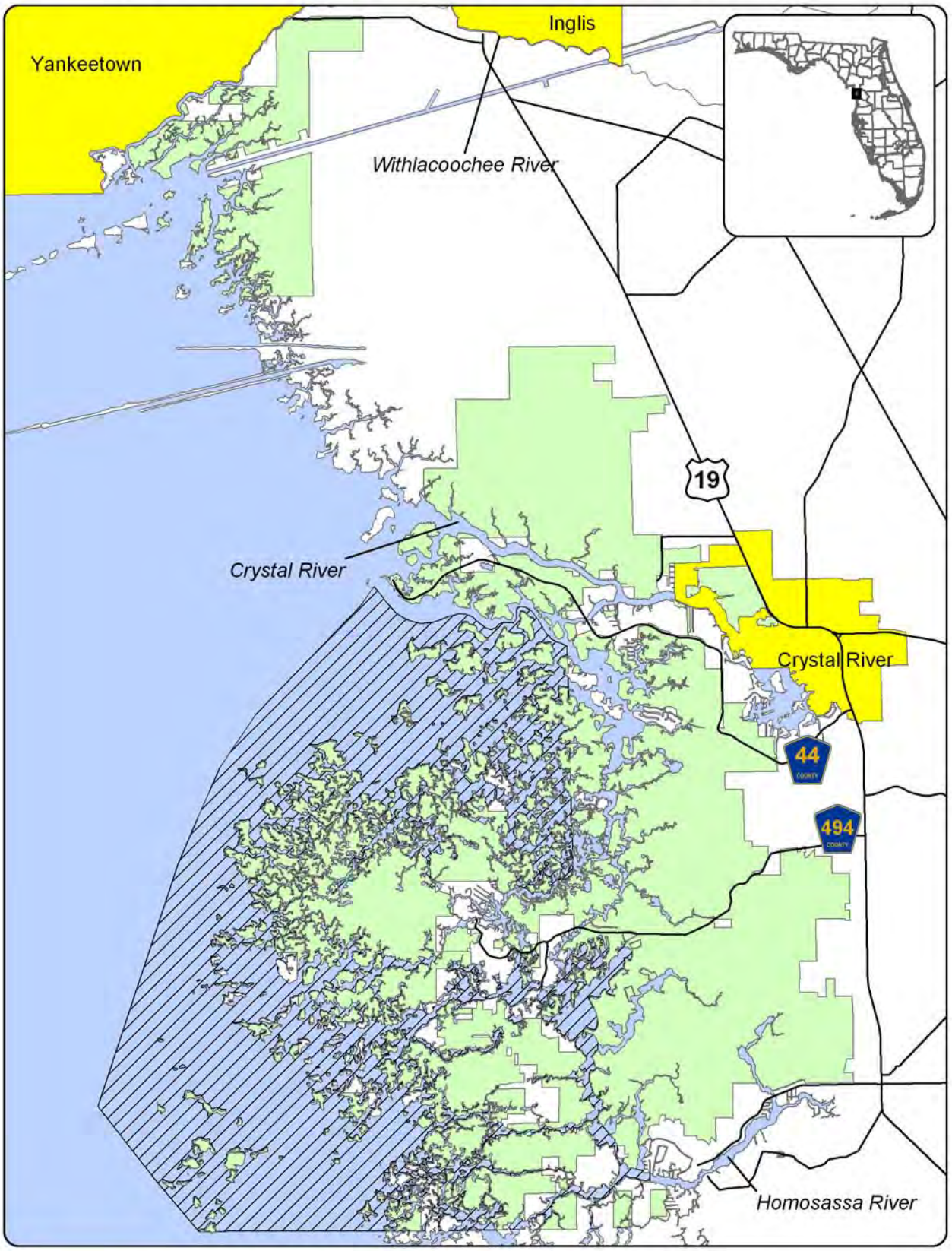
The lands were initially managed by the DEP, Division of Recreation and Parks. Management authority was transferred to CAMA in 1996 and, most recently, back to DRP in 2004. Table 1 provides an acquisition history, while Appendix 3 provides a general outline of acquisition benchmarks for the preserve.

Table 1: Acquisition Status of the Crystal River Preserve State Park	
Year	**Benchmark**
1974	First parcels donated to and purchased by the state under the EEL program.
1982	Crystal River II/Crystal Cove/Crystal River State Reserve first placed on CARL acquisition list
1983	First parcel purchased under the CARL program.
1986	Crystal River II/Crystal Cove/Crystal River State Reserve Projects combined to form the Crystal River Project.
1988	The St. Martins River CARL Project was approved.
1989	DRP released the management of Crystal River State Reserve to Bureau of Submerged Lands and Preserves, Division of State Lands.
1992	Crystal Bay CARL proposal was added to the Crystal River CARL project.
1995	The Crystal River Project was combined with the St. Martins Project and the Homosassa Reserve Project to create the Florida Springs Coastal Greenway project.
1996	CAMA given management authority as per lease # 4084.
2003	Florida Springs Coastal Greenway project moved to the Florida Forever "A" list.
2004	Management authority transferred to the Division of Recreation and Parks

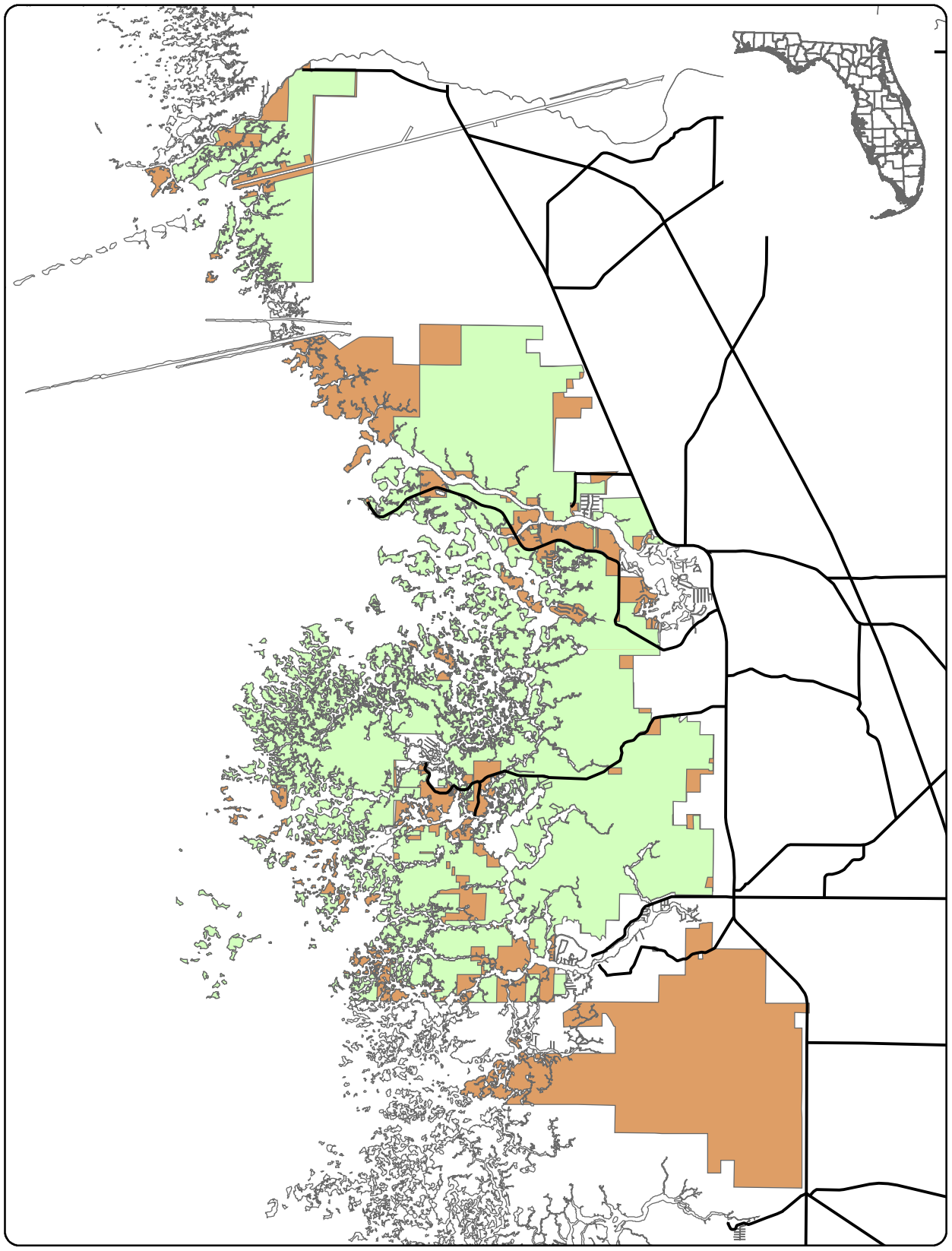
Nearby Public Lands and Designated Water Resources

There are 32 other public conservation lands within 30 miles of the preserve (Map #4). The St. Martins Marsh Aquatic Preserve surrounds a large part of the preserve. Protection of the aquatic preserve was an impetus for acquiring the preserve. The Crystal River Archaeological State Park is surrounded by the preserve and the Homosassa Springs Wildlife State Park is bounded on its northwest by the preserve. The preserve's southern boundary abuts the northern boundary of the Chassahowitzka National Wildlife Refuge. This is an important connection of public lands and the federal government has begun to establish a migratory flock of endangered whooping cranes on the refuge. It is likely that as the flock increases in numbers the cranes will utilize the preserve for foraging and roosting habitat. The northern section of the preserve brackets the Cross-Florida Greenway where it meets the Gulf of Mexico. There have been discussions between preserve staff and staff from the Office of Greenways and Trails about accessing the preserve from the Cross Florida Greenway for an equestrian trail (details are in Chapter IV). Table 2 lists all public lands in proximity to the preserve and the managing agency.

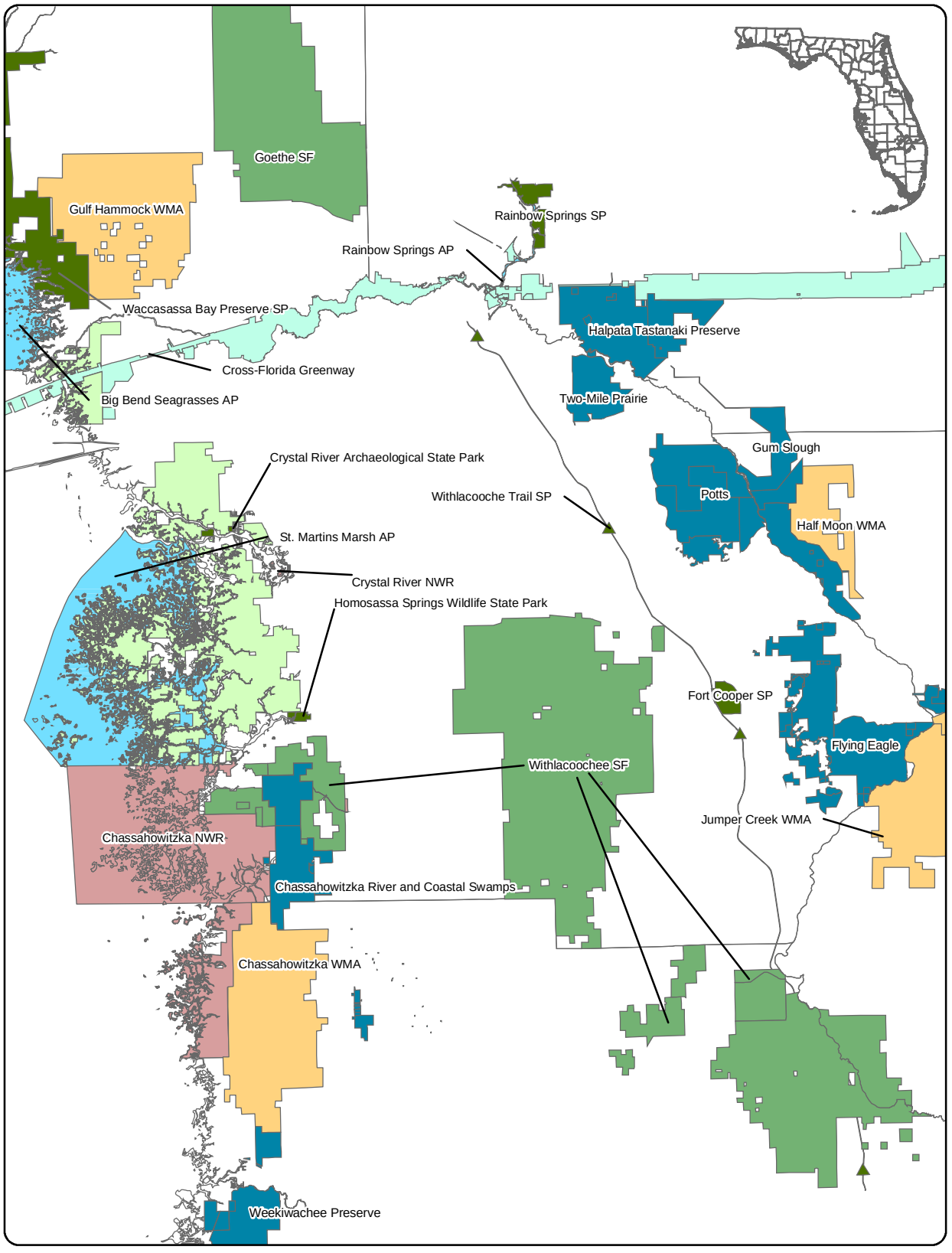
Map #2: Boundary of the Crystal River Preserve State Park



Map #3: Land Acquisition Boundary of the Florida Springs Coastal Greenway Florida Forever Project



Map #4: Other Public Lands Near the Crystal River Preserve State Park



Crystal River Preserve State Park
Aquatic Preserves (AP)
State Parks (SP)
Greenways (OGT)
State Forests (SF)
Wildlife Management Areas (WMA)
SWFWMD
National Wildlife Refuges (NWR)

Table 2. Public Lands in Proximity to the Crystal River Preserve State Park	
Parcel Name	**Managing Agency**
Chassahowitzka National Wildlife Refuge	United States Fish & Wildlife Service
Crystal River National Wildlife Refuge	United States Fish & Wildlife Service
Cedar Keys National Wildlife Refuge	United States Fish & Wildlife Service
Lower Suwannee National Wildlife Refuge	United States Fish & Wildlife Service
St. Martins Marsh Aquatic Preserve	Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas
Big Bend Seagrasses Aquatic Preserve	Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas
Rainbow Springs Aquatic Preserve	Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas
Homosassa Springs Wildlife State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Crystal River Archaeological State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Waccasassa Bay Preserve State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Rainbow Springs State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Fort Cooper State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Withlacoochee Trail State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Cedar Key Scrub State Reserve	Florida Department of Environmental Protection, Division of Recreation and Parks
Dade Battlefield Historic State Park	Florida Department of Environmental Protection, Division of Recreation and Parks
Cross-Florida Greenway	Florida Department of Environmental Protection, Office of Greenways and Trails
Goethe State Forest	Florida Division of Forestry
Withlacoochee State Forest (Citrus and Homosassa Tracts)	Florida Division of Forestry
Gulf Hammock Wildlife Management Area	Florida Fish and Wildlife Conservation Commission
Chassahowitzka Wildlife Management Area	Florida Fish and Wildlife Conservation Commission
Half Moon Wildlife Management Area	Florida Fish and Wildlife Conservation Commission
Jumper Creek Wildlife Management Area	Florida Fish and Wildlife Conservation Commission
Annutteliga Hammock	Southwest Florida Water Management District
Lake Panasoffkee	Southwest Florida Water Management District
Chassahowitzka River and Coastal Swamps	Southwest Florida Water Management District
Weeki Wachee Preserve	Southwest Florida Water Management District
Halpata-Tastanaki Preserve	Southwest Florida Water Management District
Two-Mile Prairie	Southwest Florida Water Management District
Gum Slough	Southwest Florida Water Management District
Potts Preserve	Southwest Florida Water Management District
Flying Eagle	Southwest Florida Water Management District

DEP: Aquatic Preserves / Outstanding Florida Waters

The waters adjacent to the Crystal River Preserve State Park have been designated as both an aquatic preserve and Outstanding Florida Waters. Aquatic preserves are bodies of water that were set aside by state legislation for the purpose of being preserved in an essentially natural or existing condition so that their aesthetic, biological and scientific values may endure for the enjoyment of future generations. St. Martins Marsh Aquatic Preserve was designated in October 21, 1969 and is comprised of 23,123 acres of pristine submerged and wetland areas within the west central coast of Citrus County.

Outstanding Florida Waters (OFW) are defined as waters designated by the Environmental Regulation Commission as worthy of special protection because of their natural attributes. DEP affords the highest protection to these

waters. No degradation of water quality, other than that allowed by 18-20 FAC, is to be permitted. The waters adjacent to the Crystal River Preserve State Park have been designated as OFW.

Management Authority

Effective January 1, 2004, management authority for the Crystal River Preserve State Park was transferred from the DEP/CAMA to DEP/DRP. In accordance with Chapter 258, Florida Statutes, and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks is charged with the responsibility of developing and operating Florida's recreation and parks system.

Many operating procedures are standard system wide and are set by policy. These procedures are outlined in the **Division's Operations Manual (OM)** that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, resource management, law enforcement, protection, safety and maintenance.

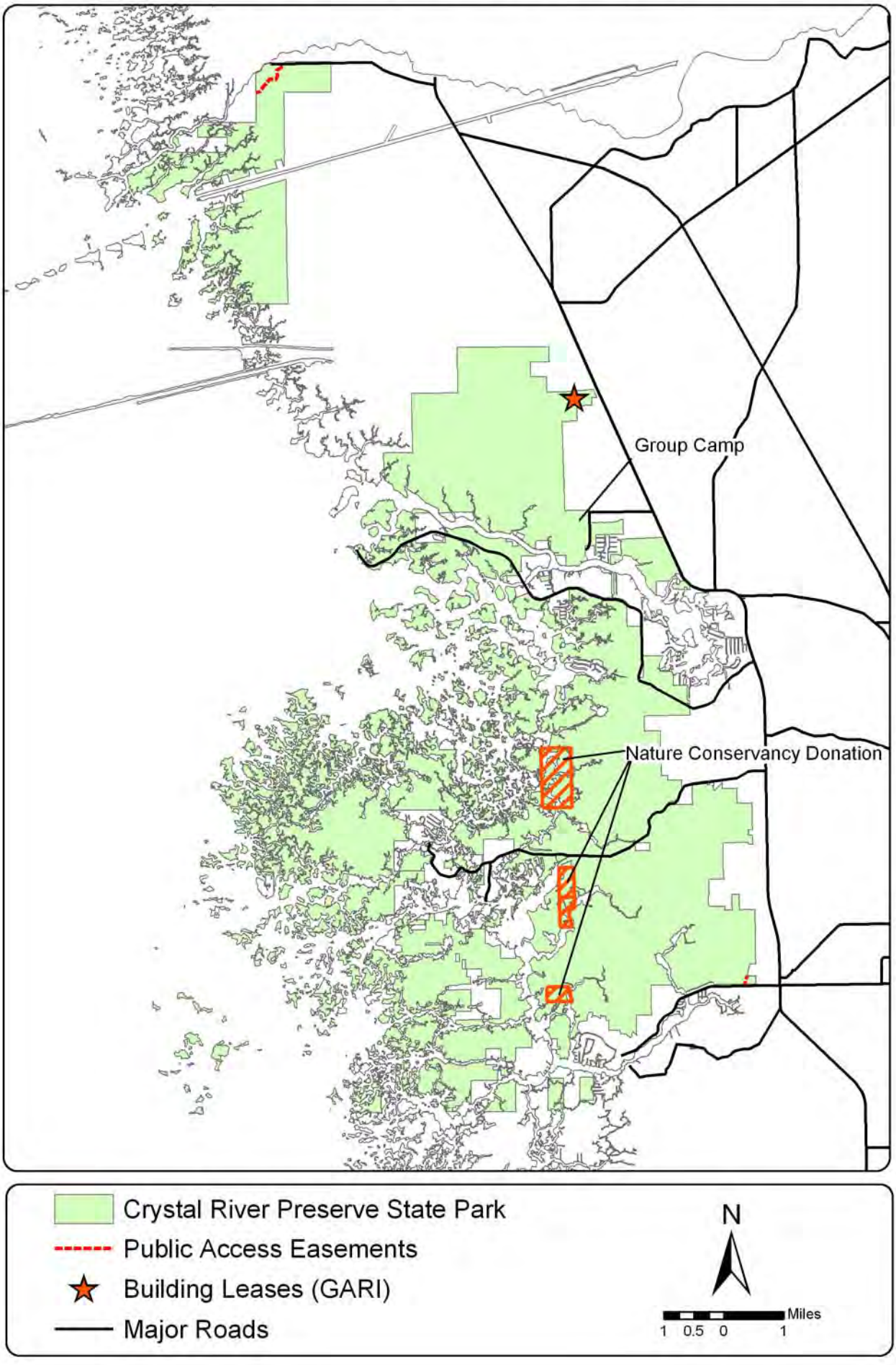
Management of this property is addressed in Lease # 4084 between the BOT and DEP/DRP (Appendix 1). The Governor and Cabinet sit as the Board of Trustees and are responsible for state-owned lands. The BOT is authorized to lease State lands to State agencies for the use and benefit of the people of the State of Florida. The lease is for 50 years.

In addition to the guidance provided for the overall management of Crystal River Preserve State Park from the documents cited above, several areas have additional management guidelines (Map #5). Sublease #4084-01 is leased to Gulf Archaeological Institute for office spaces. Three easements cross through portions of the property for the use of homeowners to access their properties. Included with the deeds to property donated by the Crystal River Development Corporation is language stating, "The purpose of this conveyance is to preserve said lands in their natural and pristine state". The Nature Conservancy donation deed states "the premises herein conveyed shall forever be held as a nature preserve, for scientific, educational and aesthetic purposes and shall be kept entirely in their natural state, without any disturbance whatever of habitat or plant or animal populations, excepting the undertaking of scientific research and the maintenance of such fences and foot trails as may be appropriate to effectuate the foregoing purposes without impairing the essential natural character of the premises."

Public Involvement

A management advisory group meeting was held at the preserve visitor center on August 3, 2004 to obtain input from both public and private stakeholders regarding management of Crystal River Preserve State Park. A summary of issues and opportunities raised by the advisory group, as well as a list of participants, is included as Appendix 4. A public hearing, as required by Ch. 259.032(10), F.S., was held on August 2, 2004 at the same location. The report of that hearing is also contained in Appendix 4.

Map #5: Special Use Areas, Leases, and Easements on the Crystal River Preserve State Park



II. Natural and Cultural Resources

This chapter describes the natural and cultural resources of the Crystal River Preserve State Park and problems affecting the resources. Chapter IV details how the resources will be managed and how the problems will be addressed.

Physiography

Topography and Geomorphology

Crystal River Preserve State Park is in Florida's Gulf Coastal Lowlands within the Mid-peninsula Zone of the state, with portions within the Coastal Swamps sub-region. Flat areas with wetlands, interspersed with pine-palmetto flatwoods, characterize the Gulf Coastal Lowlands. The major drainage systems in the area are the Withlacoochee, Crystal, and Homosassa Rivers, which all flow west through the preserve before emptying into the Gulf of Mexico. Most of the preserve is flat. Elevations range from about 10 feet above mean sea level (msl) in the scrubby portions to less than 1 foot in the western saltmarsh fringes (Map #6a, b, c).

Alterations to the topography of the preserve include fire plow scars, woods roads, man-made ponds, spoil, and other topographic manipulations.

Geology

The Crystal River Preserve State Park is situated in what is geomorphologically referred to as the Gulf Coastal Lowlands (Wolfe, 1990) (Map #7). It sits on two marine terraces, which were formed by the retreat of ancient seas. The Pamlico terrace was formed during the Pleistocene and is described as being 8-25 ft. above mean sea level and comprising most of the Gulf Coastal Lowlands and consequently most of the preserve. The sandy "high" spots on the preserve represent ancient dunes. Parcels in the northwest corner of the preserve sit on the Silver Bluff terrace, which is the most recently exposed terrace in the region. This terrace contains Pleistocene and Holocene sediments and is at or 8 ft. above mean sea level (Wolfe, 1990). Limestone underlies both these terraces. Together these two terraces have been categorized as a physiographic sub-region called the Coastal Swamps (Puri and Vernon, 1964, White, 1970).

The preserve sits on a layer of limestone bedrock that was deposited during the Eocene epoch (Davis Jr., 1997). As it is dissolved by the percolation of acidic water through the marsh sediment, the limestone has a very pitted appearance. This karst topography is responsible for the reticulated tidal creeks and elevated areas for marsh islands. The sediment layer upon this limestone bedrock is thin and there are rock outcrops in many locations throughout the preserve. The soils are primarily poorly drained and organic as there are no major river systems to move the very sandy soils of the Brooksville Ridge to the east across the Coastal Swamps to the west. The organic content of the soil coupled with the low silica content make this region heavily vegetated.

The preserve is located in an area of Florida that is transitional between temperate bioregions to the north and subtropical bioregions to the south. As a result the southern and northern limits of several plant and animal species exist within or in the vicinity of the preserve. On a global scale the preserve sits in the biogeographic region or biome termed the temperate forests (Cox & Moore, 1985). Küchler (1964) identified this region of the southeastern United States as southern floodplain forests. No matter how it is defined hot summers and mild winters typify the region where the temperature occasionally drops below freezing. Forests are generally a mix of broadleaf evergreens and pines. Fauna includes white-tailed deer, bobcat, otter and many species of rodents. There is a great diversity of birds including woodpeckers and wood warblers. The flora of the region is both abundant and diverse.

Regionally, deposits of varied origin underlie the area. In descending order, these deposits include the Ocala Group; Williston, Inglis, and Crystal River Formations; and the Avon Park Formation. Described from youngest to oldest respectively, these deposits represent the Eocene Series. The Ocala Group is the oldest formation exposed in the vicinity.

Where they occur, Ocala Group deposits are made up of nearly pure fossiliferous limestones and occasional dolostones. These deposits range to 88 feet in thickness and are generally a reliable source of potable water with the exception of areas of saltwater intrusion.

Avon Park Formation deposits range beyond 88 feet in thickness. These deposits consist primarily of fossiliferous limestones. The deposits may contain a confining layer and are generally a reliable source of potable water with the exception of areas of saltwater intrusion.

The preserve is underlain by the Floridan Aquifer and is the primary source of potable water. The aquifer is unconfined in coastal Citrus County and recharge rates are split between high in the upland portions of the preserve to very low in the wetland portions.

Soils

Of the seven soil orders that occur in Florida, four are found in the preserve. A mix of Entisols and Histosols comprise the level, poorly drained coastal marshes, while primarily Histosols dominate the poorly drained soils that are underlain by limestone (Brown et al., 1990) in the non-coastal areas of the preserve. There are five major soil series associated with the preserve. They are the Boca, Hallandale, Homosassa, Rock Outcrop and Weeki Wachee, and these and all other soil series within the preserve are represented on Maps #8a, b. Soils in the Boca series are generally associated with limestone. These soils do not reach great depths, but are the sandiest of the major series on the preserve. Soils in the Hallandale series are poorly drained mineral soils usually adjacent to saltmarshes. Where there is not a rocky outcrop the limestone bedrock is no more than 20" from the surface. Tidal flooding does occur on this soil series and marsh islands or maritime hammocks are the habitat type found growing on these soils. The Homosassa soil series is typically associated with saltmarshes. These soils are flooded daily during high tides. The Rock Outcrop series is found in the numerous islands of the preserve and is overlain by saltmarsh or mangrove stands. The soils of the Weeki Wachee series exist in broad flat tidal marshes. They are very poorly drained and contain a high degree of decomposed organic matter and are at or nearly at sea level.

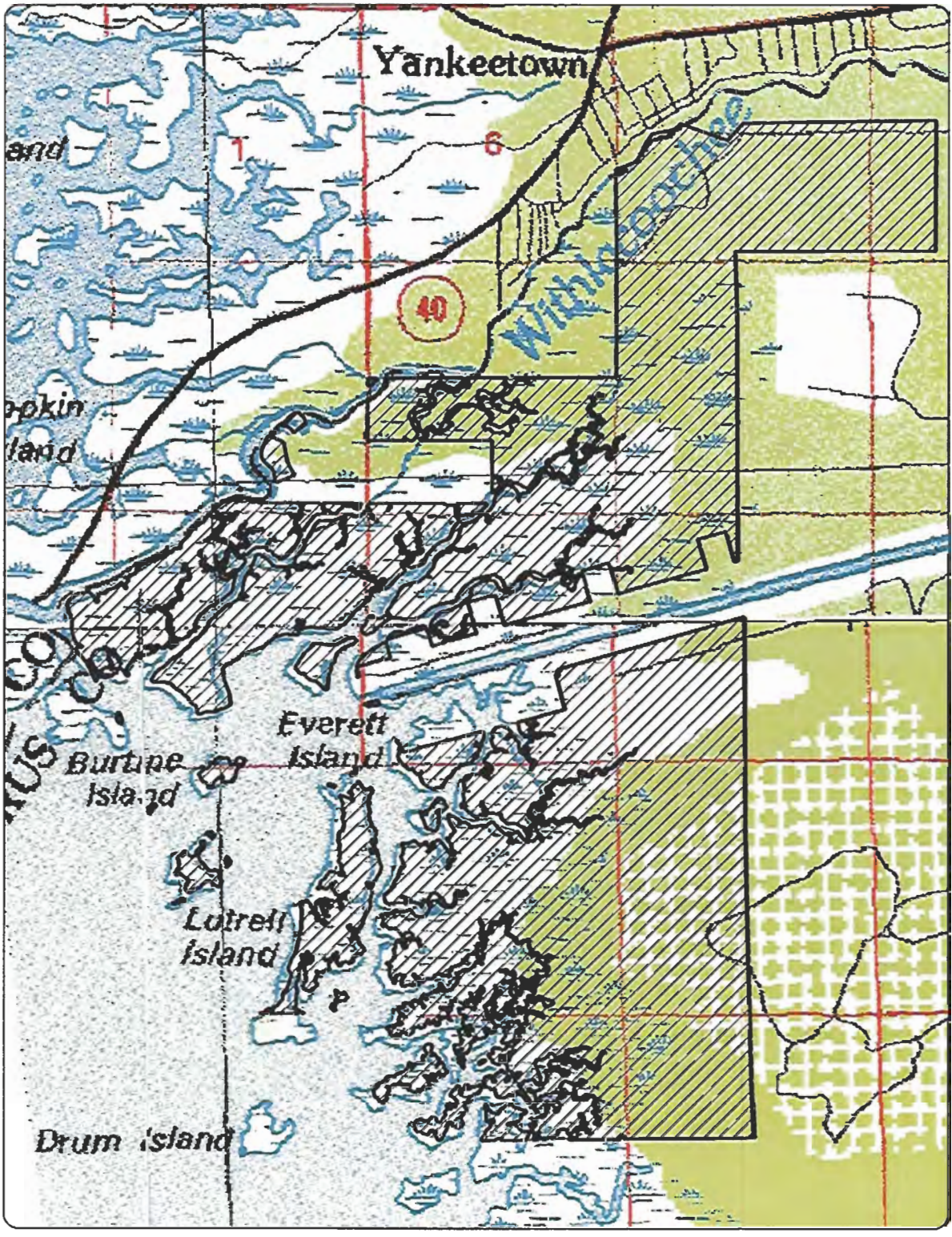
Hydrology/Water Management

The preserve sits within the area of the west coast commonly referred to as the Springs Coast. There are two spring fed rivers that run through the Crystal River Preserve State Park (Map #9a). The Crystal and Homosassa Rivers are both fed by first magnitude springs with the Crystal River classified as Class III and the Homosassa River classified as Class II. The Crystal River springs are the second largest in the state discharging 567mgd while the Homosassa Springs discharges at 124mgd (Fernald and Purdum, 1998). The Southwest Florida Water Management District has identified the Crystal River as a "priority water body" in their Surface Water Improvement and Management (SWIM) plan (1999) for the river. The northern extent of the preserve lies on the south bank of the Withlacoochee River. Much of the preserve lies within the St. Martins Marsh Aquatic Preserve, which is also managed by the Florida Department of Environmental Protection (Map #9a). The Crystal River, the headwaters of the Homosassa River, the Withlacoochee River and the St. Martins Marsh Aquatic Preserve are classified as Outstanding Florida Waters (OFW). Other water bodies include the Salt River (Class III), Little Homosassa River (Class II), and Halls River (Class II). Of the seven rivers of Citrus County, six are within the preserve. Coastal waters along Citrus County are identified as Class II waters.

The coastal end of three drainage basins lies in the preserve (Map #9a): Withlacooche River, Crystal River, and Homosassa River. However, most of the surface water drainage on the preserve is directly into coastal or estuarine waters. The movement of surface waters and overland drainage is generally east to west both regionally and within the preserve. Groundwater is very near the surface throughout much of the preserve. This is due to the karst landscape and the low-lying terrain. Solution holes through the limestone may be found in several places and groundwater is nearly always visible in these holes.

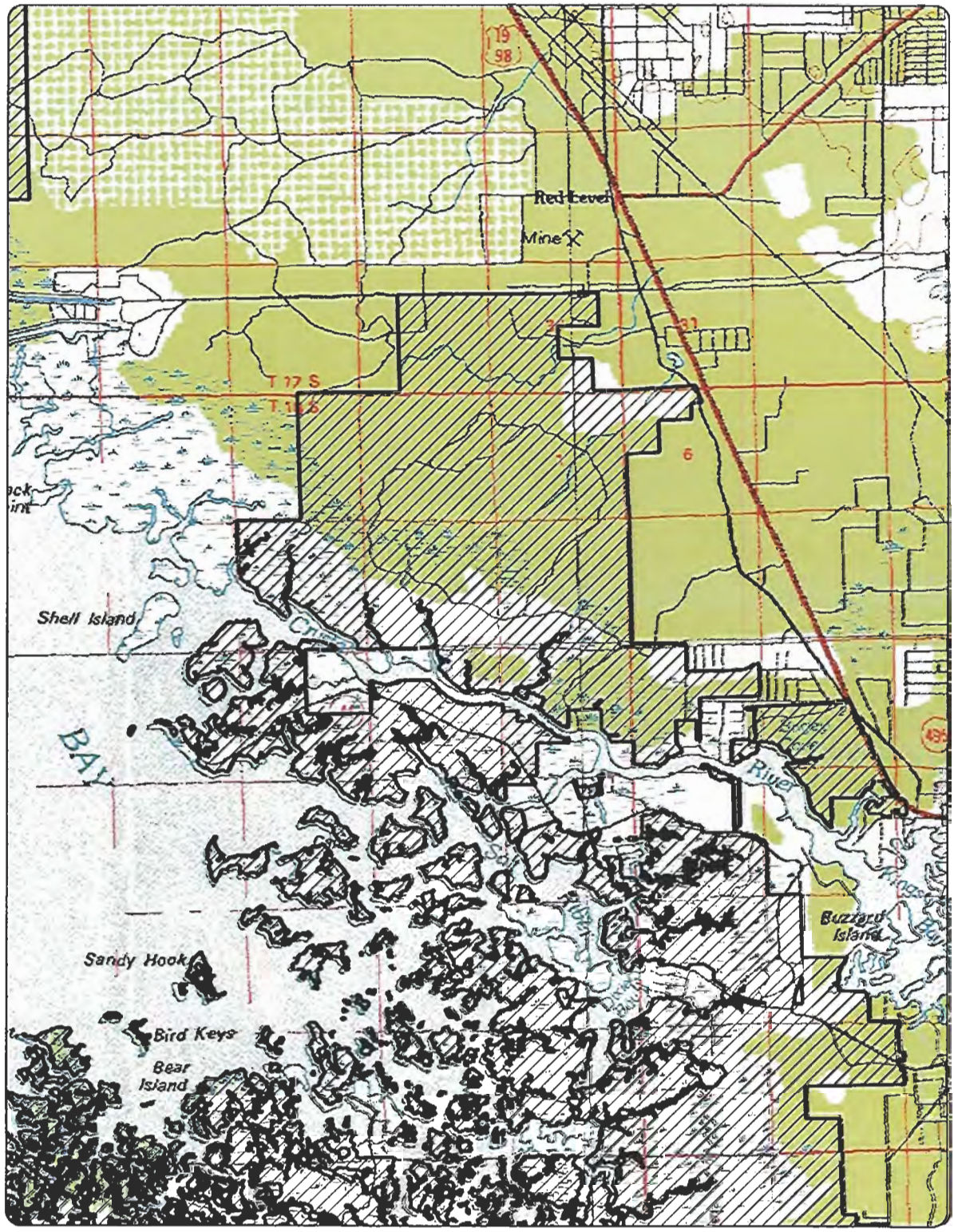
Map #9b illustrates just how much of the preserve is wetlands habitat. Estuarine tidal marsh or saltmarsh is the most common wetland habitat. Before these saltmarshes became public land they were ditched in some areas in anticipation of future development. There are also ditches on the preserve that are situated in upland areas and were intended to drain adjacent wetlands. There are five pits located on the preserve, which were excavated prior to purchase by the State. The two northernmost pits were created by the extraction of limestone. They are filled with water and the larger of the two is open to shoreline fishing. The remaining three pits were dug with plans to

Map #6a: Topographic Map of the Crystal River Preserve State Park
(North Section)
Inverness USGS 1:100k



Crystal River Preserve State Park

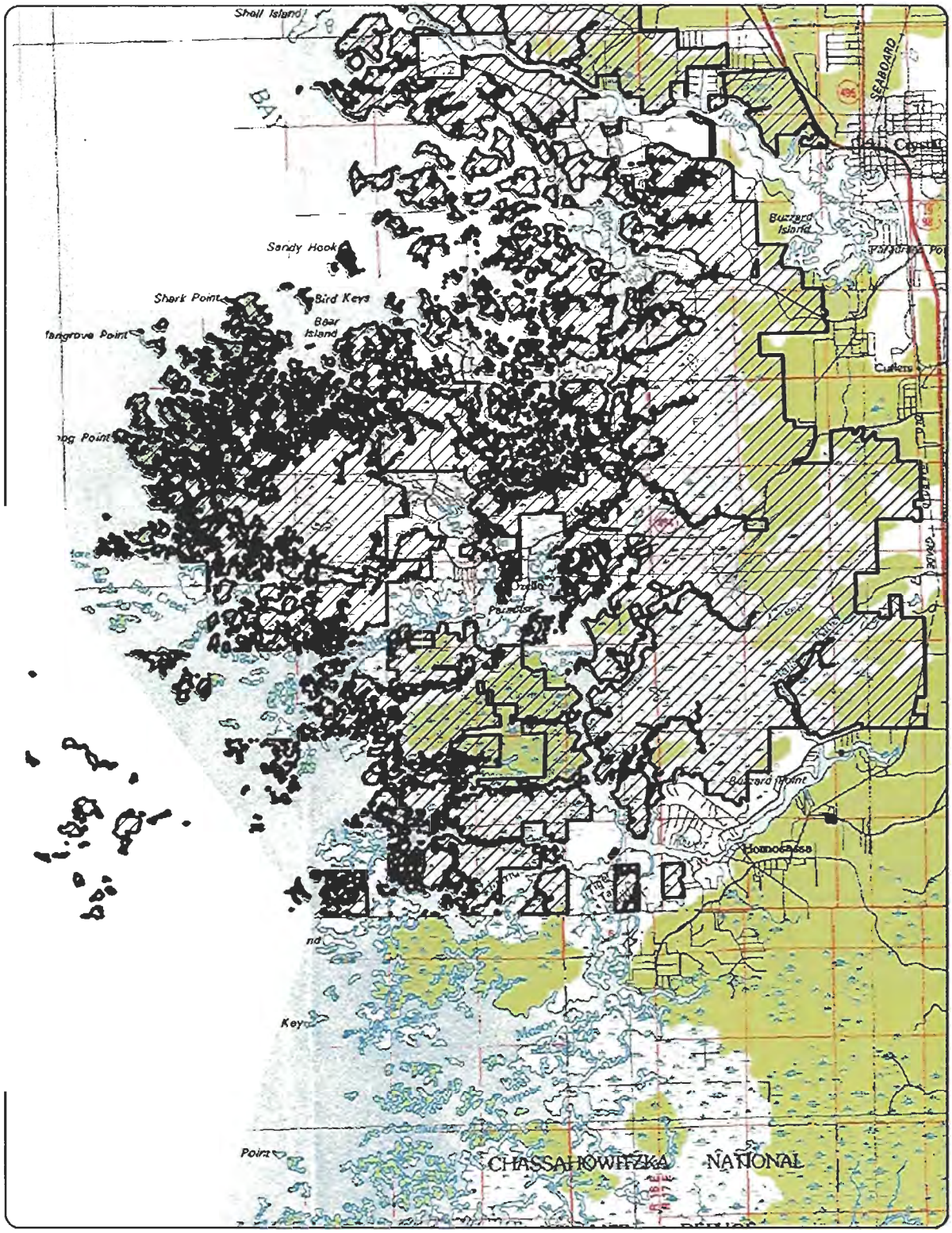
Map #6b: Topographic Map of the Crystal River Preserve State Park
(Central Section)
Inverness USGS 1:100k



Crystal River Preserve State Park

Miles
0.5 0.25 0 0.5

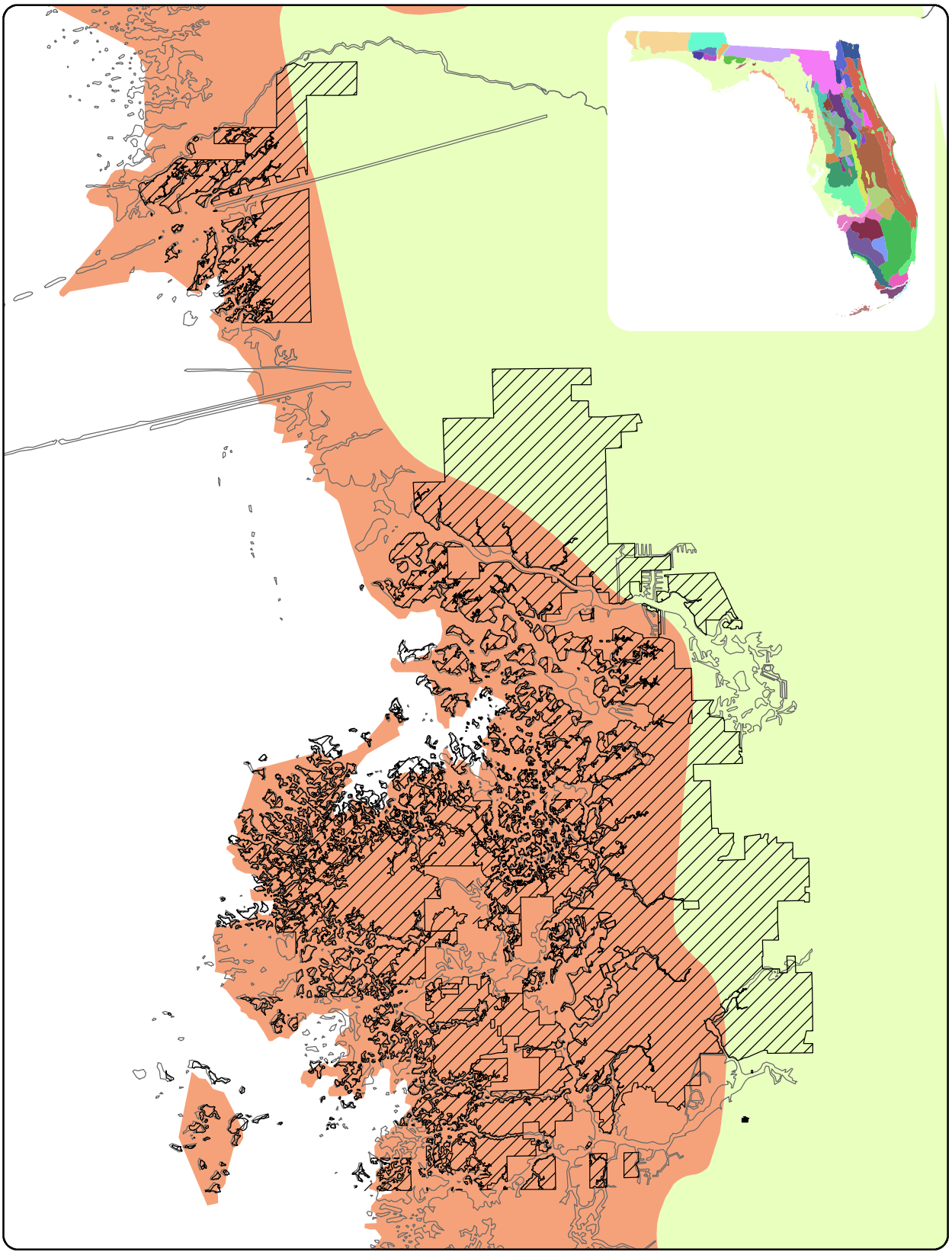
Map #6c: Topographic Map of the Crystal River Preserve State Park (South Section)
Inverness USGS 1:100k



Crystal River Preserve State Park

Miles
1 0.5 0 1

Map #7: Geomorphology Zones of the Crystal River Preserve State Park (White 1970)



Crystal River Preserve State Park

Physiographic Provinces (White 1970)

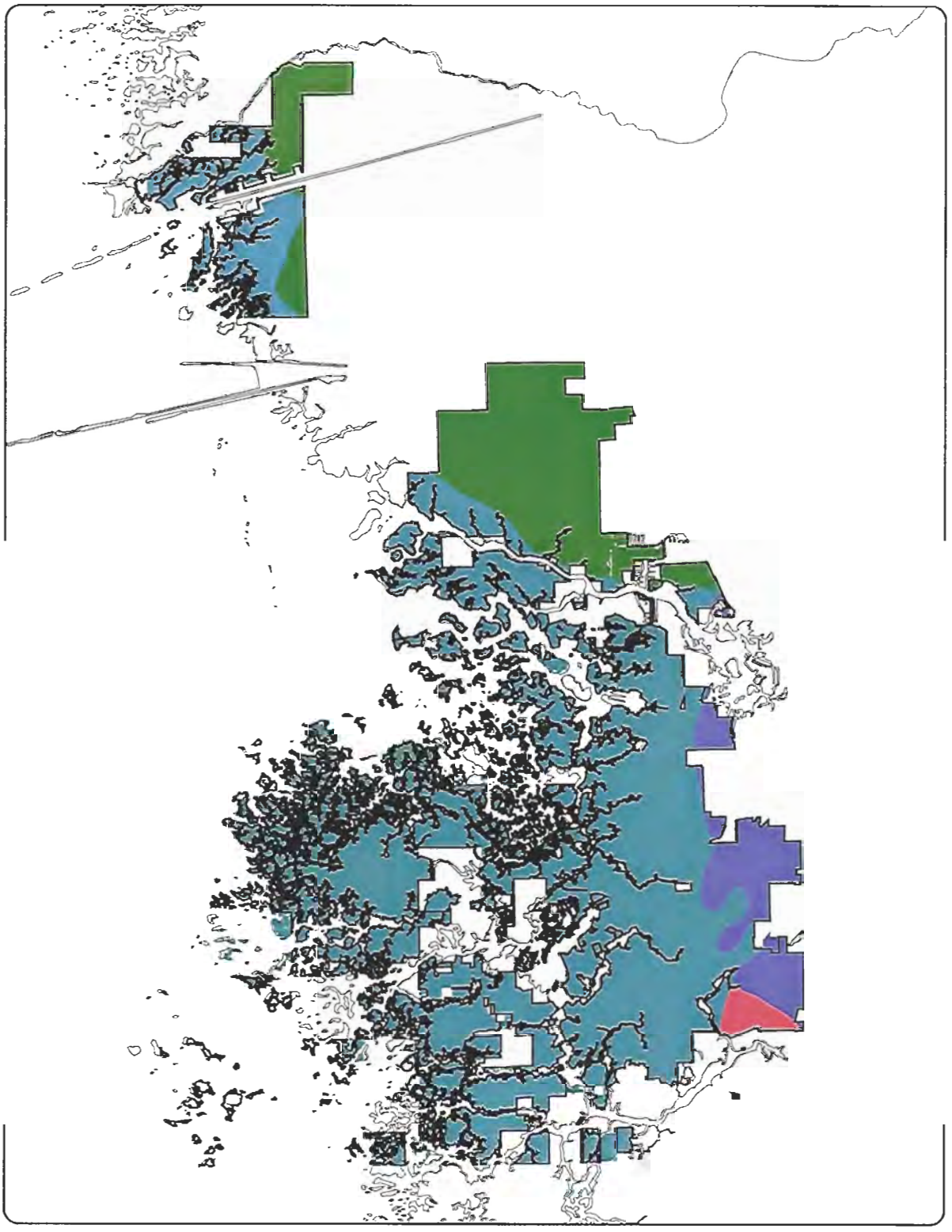
Gulf Coastal Lowlands Region

Coastal Swamps Subregion

Miles

1 0.5 0 1

Map #8a: General Soils of the Crystal River Preserve State Park



Crystal River Preserve State Park

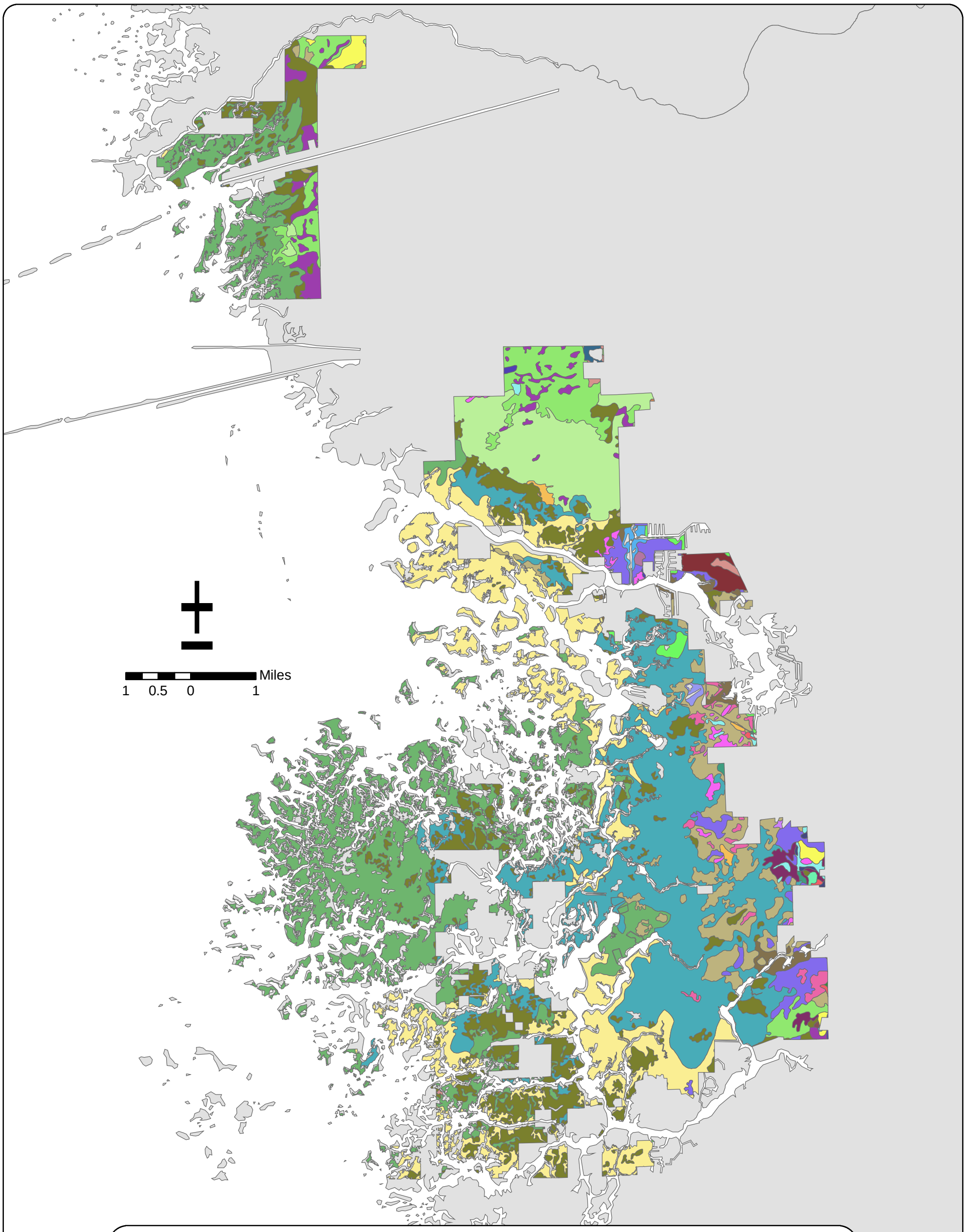
General Soils

- BOCA-JONESVILLE-OTELA (FL117)
- POMONA-EAUGALLIE-MALABAR (FL103)
- TERRA CEIA-SAMSULA-TOMOKA (FL107)
- TIDEWATER-CRACKER-HOMOSASSA (FL118)

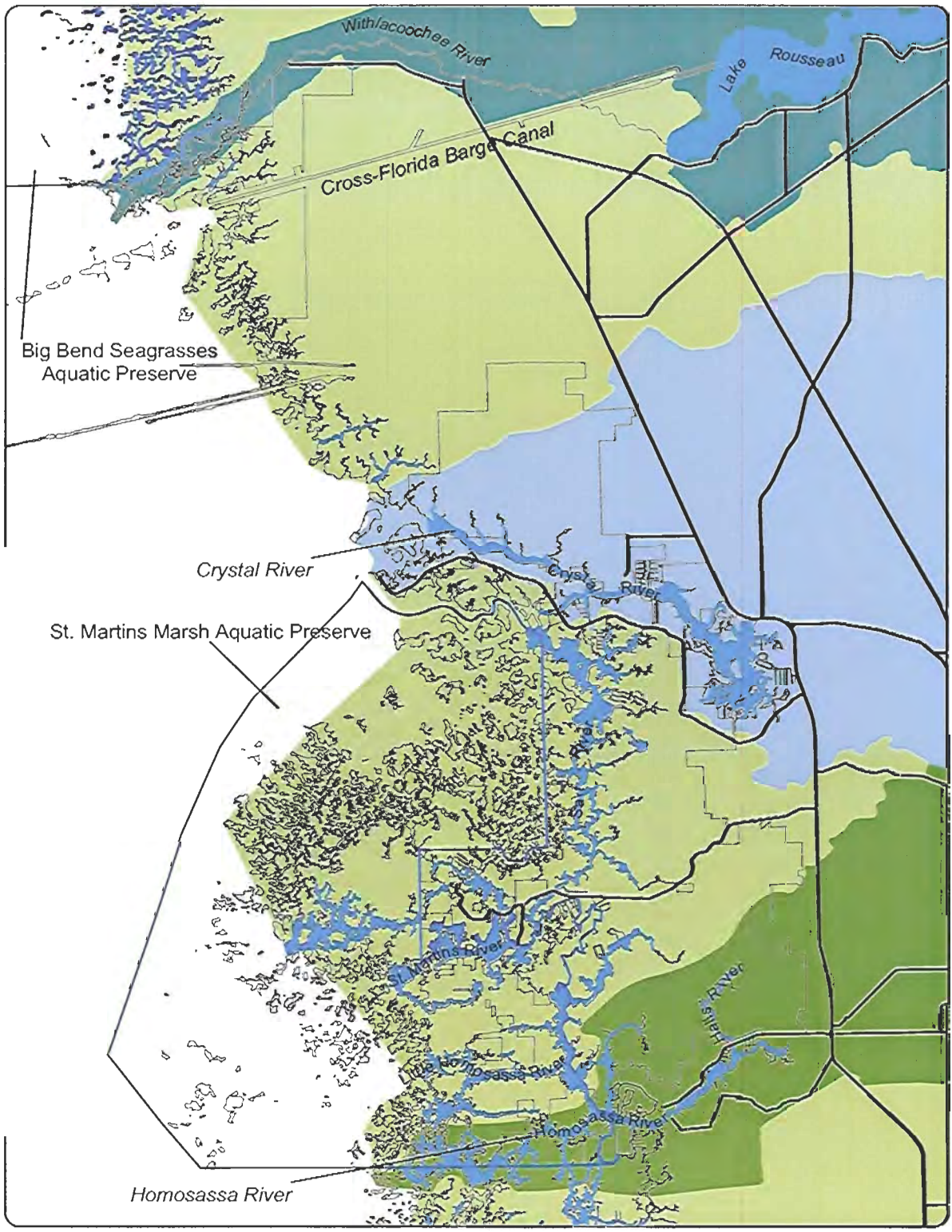
Miles

1 0.5 0 1

Map #8b: Specific Soils of the Crystal River Preserve State Park



Map #9a: Drainage Basins of the Crystal River Preserve State Park



Crystal River Preserve State Park

Rivers and Streams

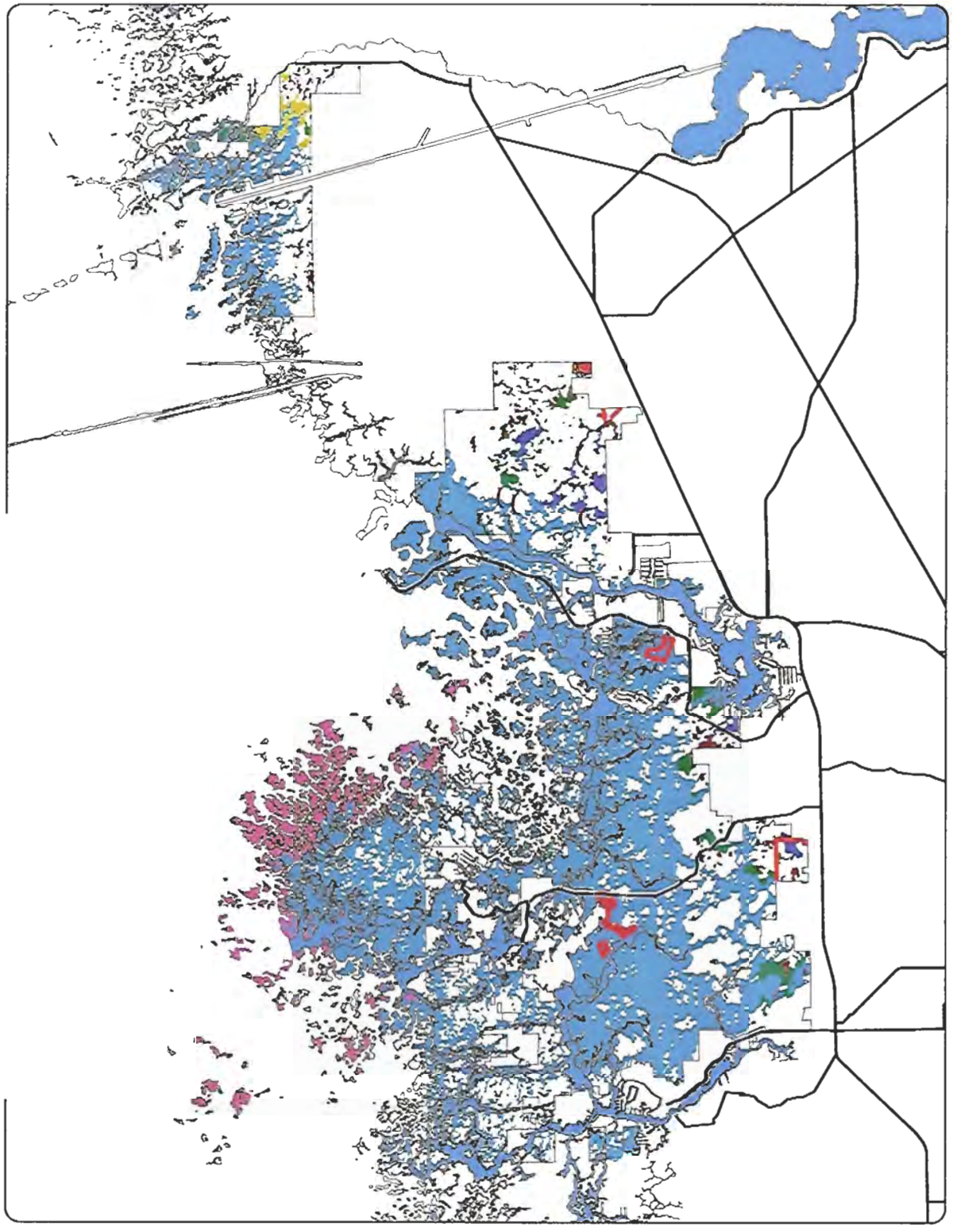
Drainage Basins

- Crystal River
- Direct Runoff to Gulf
- Homosassa River
- Withlacoochee River

Miles

0 0.5 1 2

Map #9b: Wetlands and Hydrologic Alterations of the Crystal River Preserve State Park



Crystal River Preserve State Park
Rivers and Streams

Hydrologic Alterations
Culverts
Ditches
Pits

Wetlands
Basin Marsh
Basin Swamp
Dome Swamp
Estuarine Tidal Marsh
Estuarine Tidal Swamp
Floodplain Forest
Floodplain Swamp
Freshwater Tidal Swamp

Miles
1 0.5 0 1

construct a waterfront residential area. These pits are also available for shoreline fishing. During the spring of 2002 larger culverts were placed in four locations along one of the preserve's trails. This was an effort to restore the hydrology of two tidal creeks and the drainage from hydric hammock systems. These efforts have eliminated blowouts on either side of the trail and have increased the flow to the degree that incoming and outgoing water do not stack up on one side of the trail or the other.

Climate

Late May through early October is considered the wet season in west central Florida. Thunderstorms occur nearly every afternoon and the region receives >65% of its rainfall during this period. Annual rainfall averages 54" per year. In the rainy season the weather is very humid with high temperatures in the mid 90's and lows in the upper 70's. During the dry season the temperature ranges from the upper 40's for lows to the low 70's for highs with much less humidity and the only rain coming with the arrival of cold fronts. When cold fronts pass through temperatures may dip to the low 30's, but rebound within two to three days.

Natural Communities

The Florida Natural Areas Inventory (FNAI) and the Florida Department of Environmental Protection developed the natural community classification used in this plan. The community types are defined by a variety of factors, such as vegetation structure and composition, hydrology, fire regime, topography and soil type. The community types are named for the most characteristic biological or physical feature (FNAI and DEP, 1990). FNAI also assigns Global (G) and State (S) ranks to each natural community and species that FNAI tracks. These ranks reflect the status of the natural community or species worldwide (G) and in Florida (S). Lower numbers reflect a higher degree of imperilment (e.g., G1 represents the most imperiled natural communities worldwide, S1 represents the most imperiled natural communities in Florida). Appendix 5 provides a full explanation of the FNAI ranking system.

A mosaic of natural communities is found within Crystal River Preserve State Park, with varying degrees of disturbance from relatively pristine in the saltmarshes to moderately disturbed in some of the pine flatwoods areas. Sixteen types of natural communities occur within the preserve. The ruderal and spoil categories are not FNAI community types, but are the most appropriate description of the land coverage. Two of the natural communities found within the preserve, scrub and sandhill, are ranked by FNAI as S1 or S2, Critically Imperiled or Imperiled in Florida, respectively. These two community types have been primarily impacted by fire suppression, resulting in overgrown, unnatural conditions. Sandhill habitat has also been impacted by silviculture practices, which disturbed the soil and replaced native longleaf pines with north Florida slash pine. An additional eight community types Marsh (Prairie) Hammock, Estuarine Tidal Swamp, Pine Flatwoods, Scrubby Flatwoods, Basin Marsh, Freshwater Tidal Swamp, Floodplain Forest, Dome Swamp) are ranked as S3, Very Rare or Local throughout Range in Florida. The most common natural communities in the project area are estuarine tidal marsh, hydric hammock, marsh (prairie) hammock, and estuarine tidal swamp. Most of these habitats have low levels of disturbance, aside from hydrologic alterations, which have impacted most of Florida. Based on FNAI's natural community classification, 89.5% of the preserve is wetland habitat. The four most abundant natural community types comprise 84.1% of the preserve.

A location of the natural communities within the preserve may be found on Map #10. Data used to produce the map were developed by the preserve staff using multiple sources that include, but were not limited to: Southwest Florida Water Management District's 1999 year Florida Land Use Cover and Forms Classifications System (FLUCCS), 1999 Digital Ortho-photographs, and National Wetlands Inventory (NWI). Much of these data were then ground-truthed by staff. The descriptions of the natural community types have been adapted from the FNAI 's Guide to the Natural Communities of Florida. The following paragraphs provide a description of each natural community, which are summarized in Table 3. Additionally, Appendix 5 gives detailed accounts of the FNAI natural community types.

Table 3. Coverage and Ranking of FNAI Natural Community Types on the Crystal River Preserve State Park				
FNAI Natural Community Type	**Total Acres**	**% coverage**	**Global Rank[a]**	**State Rank[a]**
Estuarine Tidal Marsh	16,903	56.41	G4	S4
Hydric Hammock	3,734	12.46	G4	S4?
Marsh (Prairie) Hammock	2,824	9.42	G4	S3
Estuarine Tidal Swamp	1,747	5.83	G3	S3
Mesic Flatwoods	1,166	3.89	G2	S3
Scrubby Flatwoods	946	3.16	G3	S3
Basin Marsh	418	1.39	G?	S4?
Floodplain Swamp	389	1.30	G4	S4
Basin Swamp	348	1.16	G?	S4?
Freshwater Tidal Swamp	299	1.00	G3	S3
Scrub	292	0.97	G2	S2
Upland Mixed Forest	237	0.79	G4	S4
Wet Prairie	190	0.63	G3	S2
Floodplain Forest	143	0.47	G4	S3
Ruderal[b]	117	0.39	-	-
Borrow Pits (unclassified)[b]	79	0.26	-	-
Spoil[b]	57	0.19	-	-
Sandhill	41	0.14	G3	S2
Dome Swamp	31	0.10	G4?	S3?
Developed[b]	5	0.02	-	-

[a] – refer to Appendix 4 for explanation of global and state ranks
[b] – cover type is not classified by FNAI

Basin Marsh - This habitat type covers 418 acres or 1.39% of the preserve. These freshwater marshes are typified by herbaceous cover that generally includes pickerel weed (*Pontederia cordata*), duck potato (*Sagittaria lancifolia*), sawgrass (*Cladium jamaicense*) and Virginia chain fern (*Woodwardia viginica*). The upland border of the basin marsh consists of Carolina willow (*Salix caroliniana*) and buttonbush (*Cephalanthus occidentalis*). This habitat is commonly used by cotton rat (*Sigmodon hispidus*), green tree frog (*Hyla cinerea*) and red-winged blackbird (*Agelaius phoeniceus*).

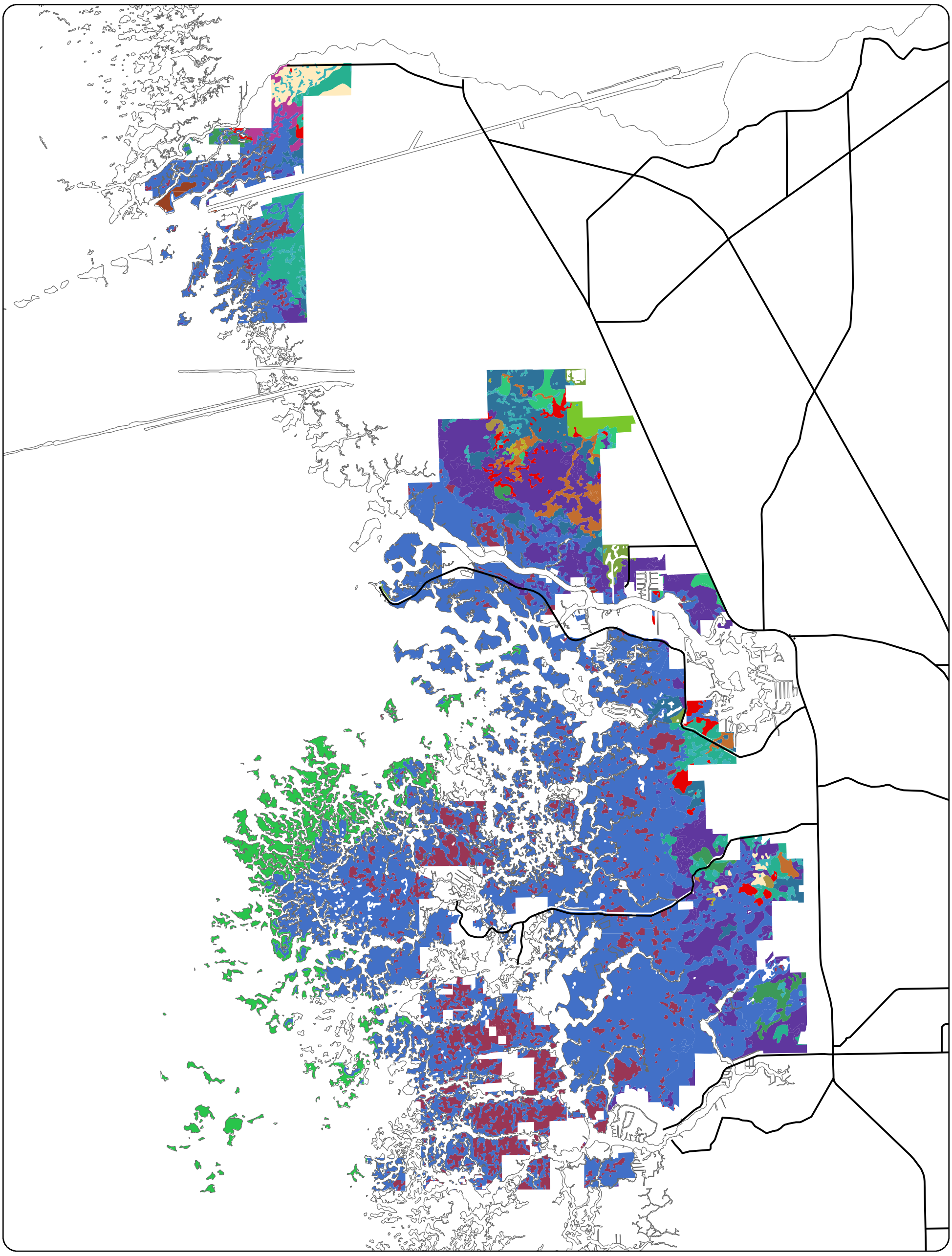
Basin Swamp - The basin swamp community covers 348 acres or 1.16%. Flora associated with this habitat are black gum (*Nyssa sylvatica* var. *biflora*), red maple (*Acer rubrum*), sweet bay (*Magnolia virginiana*) and swamp bay (*Persea palustris*). Animals typically found in basin swamps include raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), striped mud turtle (*Kinesternon bauri*), cottonmouth (*Agkistrodon piscivorus*), barred owl (*Strix varia*), wood duck (*Aix sponsa*) and pileated woodpecker (*Dryocopus pileatus*).

Developed - The portion of the preserve that is classified as developed is the 5 acres or 0.02% of the preserve where the office, visitor center, parking lot and boat yard sit. This is the smallest land cover type on the preserve. There is a native landscape garden on this site which mourning doves (*Zenadia macroura*), ruby-throated hummingbird (*Archilochus colubris*) and black racer (*Coluber constrictor*) frequent. Bahiagrass (*Paspalum notatum*) is the dominant vegetation in this developed area.

Dome Swamp - At 31 acres or 0.10% of the preserve, dome swamp is the smallest community type represented. The very few cypress (*Taxodium distichum*) that exist on the preserve are found in this dome swamp habitat. Other plants include slash pine (*Pinus elliottii*), dahoon holly (*Ilex cassine*), lizard's tail (*Saururus cernuus*) and cinnamon fern (*Osmunda cinnamomea*). Narrow-mouthed toad (*Gastrophryne carolinensis*), barred owl and swallow-tail kite (*Elanoides forficatus*) may be observed in this habitat.

Floodplain Forest - This community type is found only in the northernmost section of the preserve and it covers 143 acres or 0.48% of the preserve. Floodplain forests are inundated a portion of the growing season and exist at slightly higher elevations than the floodplain itself. Common examples of vegetation

Map #10: FNAI Natural Communities of the Crystal River Preserve State Park



are red maple, sweet bay, dahoon holly, green ash (*Fraxinus pennsylvanicus*), water oak (*Quercus nigra*), water hickory (*Carya aquatica*), and rattan vine (*Berchimia scandens*). Typical fauna associated with this habitat are barred owl, pileated woodpecker, hooded warbler (*Wilsonia citrina*), southeastern five-lined skink (*Eumeces inexpectatus*), alligator (*Alligator mississippiensis*) and raccoon.

Floodplain Swamp - Floodplain swamps differ from floodplain forests in that they are inundated most of the year. On the preserve this habitat type covers 389 acres or 1.30%. Floristic components include black gum, dahoon holly, sweet bay, royal fern (*Osmunda regalis*), leather leaf fern (*Acrostichum danaeifolium*) and lizard's tail. River otter, cottonmouth, snapping turtle (*Chelydra serpentina*), wood duck, barred owl, and red-eyed vireo are commonly found in this community type.

Freshwater Tidal Swamp - Sweet bay, green ash, swamp bay, black gum and cabbage palm (*Sabal palmetto*) comprise this community type which covers 299 acres or 1.00%. Alligator, river otter, swallow-tail kite and wood stork (*Mycteria americana*) may be found in this habitat.

Hydric Hammock - This is the second most common habitat on the preserve, covering 3,734 acres or 12.46% of it. Hydric hammock supports a wide diversity of plants including southern magnolia (*Magnolia grandiflora*), cabbage palm, laurel oak (*Quercus laurifolia*), American elm (*Ulmus americana*), southern red cedar (*Juniperus virginiana*), musclewood (*Carpinus caroliniana*), pignut hickory (*Carya glabra*), saw palmetto (*Serenoa repens*), hackberry (*Celtis laevigata*), Virginia creeper (*Parthenocissus quinquefolia*), needle palm (*Rhapidophyllum hystrix*) and yaupon holly (*Ilex vomitoria*). Common animals include white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), wood rat (*Neotoma floridana*), yellow rat snake (*Elaphe obsoleta*), box turtle (*Terrapene carolina*), northern parula (*Parula americana*), black-and-white warbler (*Mniotilta varia*), northern cardinal (*Cardinalis cardinalis*), red-eyed vireo (*Vireo olivaceus*), Carolina wren (*Thryothorus ludovicianus*) and red-shouldered hawk (*Buteo lineatus*).

Mesic Flatwoods - Pine flatwoods occupy 1,166 acres or 3.89%, and is the largest upland community type on the preserve. Much of this habitat is pine plantation and is being converted back to a more natural flatwoods community. Typical plant species include slash pine, longleaf pine (*Pinus palustris*), saw palmetto, Virginia creeper, cabbage palm, gallberry (*Ilex glabra*) and lowbush blueberry (*Vaccinium myrsinites*). White-tailed deer, cotton mice (*Peromyscus gossypinus*), short-tail shrew (*Blarina brevicauda*), eastern towhee (*Piplio erythrophthalmus*), summer tanager (*Piranga rubra*), great crested flycatcher (*Myiarchus crinitus*), northern bobwhite (*Colinus virginianus*) and fence lizard (*Scleroporus undulatus*).

Marsh (Prairie) Hammock - Marsh hammock habitat covers the third largest area of the preserve at 2,823 acres or 9.42%. This community type represents the hammock islands that are embedded in the saltmarsh and is usually found where limestone outcrops are above the level of the marsh. Cabbage palm, red cedar, live oak (*Quercus viginiana*) and poison ivy (*Toxicodendron radicans*) are the most commonly observed plants. Fauna includes red-bellied woodpecker (*Melanerpes carolinus*), American robin (*Turdus migratorius*) and pygmy rattlesnake (*Sistrurus miliarius*).

Ruderal - The areas of the preserve that were prepared for development and ultimately purchased by the state are described as ruderal. These areas have been dedicated for public use (fishing) and cover 117 acres or 0.39% of the preserve. Southern red cedar grows particularly well in these disturbed areas as well as dog fennel, beggar ticks (*Bidens alba*), goldenrod (*Soledago* spp.), cabbage palm and pepper vine (*Ampelopsis arborea*). Most animals found in ruderal areas are interlopers and include raccoon, opossum, northern mockingbird (*Mimus polyglottus*) and gray catbird (*Dumetella carolinensis*).

Sandhill - Sandhill is the smallest natural upland community represented on the preserve. It accounts for only 41 acres or 0.14%. Much of this community type has been planted with slash pine, some of which has been logged as part of a habitat restoration effort. Longleaf pine, turkey oak (*Quercus laevis*), gopher apple (*Licania michauxii*), Florida paintbrush (*Carphephorus corymbosus*), partridge pea (*Cassia chamaecrista*), queen's delight (*Stillingia sylvatica*) and bracken fern (*Pteridium aquilinum*) are typical plants found in this area. Commonly observed fauna include the Florida gopher tortoise (*Gopherus polyphemus*), six-lined

racerunner (*Cnemidophorus sexlineatus*), indigo snake (*Drymarchon corais*), downy woodpecker (*Picoides pubescens*), great crested flycatcher and cotton mouse.

Scrub - This xeric habitat comprises 292 acres or 0.97%. This natural community type is defined by three species of oak: scrub live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*) and Chapman's oak (*Quercus chapmanii*). Other plants include saw palmetto, milkpea (*Galactia elliottii*), tarflower (*Bejaria racemosa*) and rusty lyonia (*Lyonia ferruginea*). Six-lined racerunner, oak toad (*Bufo quercicus*), eastern towhee and Florida scrub jay (*Aphelocoma coerulescens*) have all been observed in the scrub.

Scrubby Flatwoods - This community type is primarily found in the northern extent of the preserve and covers 946 acres or 3.16%. Longleaf pine and slash pine make up the canopy of this habitat while the understory consists of saw palmetto, sand live oak, myrtle oak, Chapman's oak, staggerbush (*Lyonia fruticosa*), huckleberry (*Gaylussacia dumosa*) and garberia (*Garberia heterophylla*). White-tailed deer, red-bellied woodpecker, eastern towhee, tufted titmice (*Baeiolophus bicolor*) and brown thrasher (*Toxostomum rufum*) are typically found in this habitat.

Spoil - The 57 acres or 0.19% coverage of spoil is associated with past dredging activities for the Cross Florida Barge Canal (now the Cross Florida Greenway). This habitat is sparsely vegetated, but may include sea oxeye and sea blite (*Suaeda linearis*). Shore birds typify the animals found here and include royal tern (*Sterna maxima*), sandwich tern (*Sterna sandvicensis*), black skimmer (*Rynchops niger*), laughing gull (*Larus atricilla*) and sanderling (*Calidris alba*).

Tidal Marsh - At 16,903 acres or 56.41%, estuarine tidal marsh covers 4.5 times more area than the next largest community type (hydric hammock). Much of the surface water run-off into the Gulf of Mexico passes directly through these estuarine tidal marshes also known as saltmarshes. Saltmarshes are a dominant habitat type in this region as the coast has a very low energy wave environment, which allows for the accumulation of the sediments upon which saltmarsh vegetation thrives. Black needle rush (*Juncus roemarianus*) dominates this community type from the high marsh to the water's edge. Other flora represented are smooth cordgrass (*Spartina alterniflora*), saltgrass (*Distichlis spicata*), glasswort (*Salicornia perennis*), sea oxeye (*Borrichia frutescens*) and seaside goldenrod (*Solidago sempervirens*). Common animal inhabitants include cotton rat, rice rat (*Oryzomys palustris*), clapper rail (*Rallus longirostris*), marsh wren (*Cistothorus palustris*), saltmarsh periwinkle (*Littorina irrorata*) and fiddler crab (*Uca* spp.).

Tidal Swamp - This community type represents the mangrove islands and fringes of the preserve. It accounts for 1,747 acres or 5.83% of the area of the preserve. The two plants that dominate this habitat are red mangrove (*Rhizophora mangle*) and black mangrove (*Avicennia germinans*). While both species are found in the intertidal zone, red mangrove is found at the water's edge and black mangrove is immediately behind. Nearly a decade of mild winters has allowed this community type to expand its aerial coverage, converting saltmarsh into mangrove habitat (Stevens, 1999). These mangrove islands and fringes provide rookery and roosting habitat for several species of birds, including brown pelican (*Pelecanus occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), yellow-crowned night heron (*Nyctanassa violacea*) and red-winged blackbird. Mangrove tree crab (*Aratus pisonii*) are abundant in this community type.

Unclassified - Unclassified areas are borrow pits filled with water and surrounded by the preserve. All of these areas were mined for limestone prior to purchase by the state. Just 79 acres or 0.26% of the preserve is covered by these borrow pits. Most have no littoral shelf and so support little to no plant life. Largemouth bass (*Micropterus salmoides*), alligators and the Florida cooter (*Psuedemys floridana*) have been observed in these borrow pits.

Upland Mixed -This natural community type is found over 237 acres or 0.79% of the preserve. Common plants in this variable habitat include southern magnolia, southern red cedar, laurel oak, cabbage palm, loblolly pine (*Pinus taeda*), hackberry, pignut hickory, hop hornbeam (*Ostrya virginiana*), greenbrier (*Smilax* spp.), yaupon holly and American beautyberry (*Callicarpa americana*). The diversity of fauna is

great in this habitat and white-tailed deer, raccoon, bobcats, cotton mice, golden mice (*Ochrotomys nuttalli*), tufted titmice, Carolina chickadee (*Poecile carolinensis*), red-bellied woodpecker, downy woodpecker, Carolina wren, pine warbler (*Dendroica pinus*), northern parula (*Dendroica parula*), green tree frog, black racer and coral snake (*Micrurus fulvius*) have all been observed.

Wet Prairie - This habitat covers 190 acres or 0.63%. Traditionally, this acreage was used to graze cattle and through the years the tree density has increased and native grasses have expanded their coverage. The pasture is the location of two trailheads and one complete trail. Common plant species include slash pine, wax myrtle (*Myrica cerifera*), salt myrtle (*Baccharis halimifolia*), broom sedge (*Andropogon virginicus*), black eyed susan (*Rudbeckia hiruhirta),* dog fennel (*Eupatorium capillifolium*), bahiagrass, maidencane (*Panicum hemitomon),* and muscadine grape (*Vitis* sp.). The openness of the pasture habitat make it ideal for birds of prey like American kestrel (*Falco sparverius*), red-shouldered hawk, red-tailed hawk (*Buteo jamaicensis*) and sharp-shinned hawk (*Accipiter striatus*). Other fauna in the community type include white-tailed deer, bobcat (*Lynx rufus*), eastern bluebird (*Sialia sialis*), wild turkey (*Meleagris gallopavo*) tree swallow (*Tachycineta bicolor*), Carolina wren, yellow-rumped warblers (*Dendroica coronata*), mourning dove and black racer.

Native Species

The Natural Communities section above highlights common native plant and animal species found in the different habitats within the Crystal River Preserve State Park. The great diversity of natural communities within the preserve gives way to the diverse flora and fauna. Appendix 6 provides a comprehensive list of the 278 vertebrate fauna that are known to occur on the preserve. Of these, 34 are mammals, 186 are birds, and 58 are herptiles while 51 are listed species and 13 non-native.

The University of South Florida's Institute for Systematic Botany recognizes 1,099 species of vascular plants in Citrus County. While not all of these plants reside within the boundaries of the preserve, the preserve does contain a wide variety of natural communities and the possibility for many of these species to occur does exist. The preserve herbarium has 239 plant species that have been vouchered with the University of Florida and continues to collect new herbarium specimens (Appendix 6). Refer to the Natural Communities section for an account of species that typify the ecological habitats found on the preserve.

Terrestrial, freshwater and marine invertebrates all inhabit the preserve. The potential invertebrate species that may be found here reaches into the thousands, but only the commonly observe or important species will be identified here. Butterflies and moths are an obvious feature of terrestrial landscapes and they are an important means of pollination for plant species. Some examples are the monarch (*Danaus plexippus*), black swallowtail (*Papilio polyxenes*), eastern tiger swallowtail (*Pterourus glaucus*), pipevine swallowtail (*Battus philenor*), giant swallowtail (*Heraclides cresphontes*), cloudless sulfur (*Phoebis sennae*), banded hairstreak (*Satyrium calaus*), gulf fritillary (*Dione vanillae*), zebra long wing (*Heliconius chartitonius*), painted ladey (*Vanessa virginiensis*), long tailed skipper (*Urbanus proteus*) and hummingbird clearwing (*Hemaris thysbe*). Dragonflies and damselflies patrol the air near wetlands and prey heavily on other insects. Common green darner (*Anax junius*), swamp darner (*Epiaeschna heros*), prince basket tail (*Epitheca princeps*), great blue skimmer (*Libellula vibrans*), blue dasher (*Pachydiplax longipennis*), common spreadwing (*Lestes disjunctus*) and blue-ringed dancer (*Argia sedula*) are common species of the preserve.

Bees and wasps including the velvet ant (*Dasymutilla* sp.), cricket hunter (*Chlorion sp*.) and cicada killer (*Sphecius sp*.) and other flying insects are well represented on the preserve. Also present on the preserve are grasshoppers, including the southeastern lubber grasshopper (*Romalea microptera*). There are also a variety of beetles, ants and arachnids, including the golden silk orbweaver (*Nephila clavipes*), yellow garden spider (*Argiope aurantia*), and spiny-backed orbweaver (*Gasteracantha cancriformis*). Some native invertebrates likes ticks, no-see-ums, yellow flies and mosquitoes are very abundant on the preserve and impossible to ignore. Freshwater invertebrates include the larval or nymph phase of dragonflies and damselflies, water striders, larval mosquitoes and crayfish. Blue crab (*Callinectes sapidus*), fiddler crab (*Uca sp*.), Carolina marsh clam (*Polymesoda caroliniana*) and ribbed mussel (*Geukensia demissa*) are the most notable invertebrates found in the estuarine extent of the preserve.

Listed Species

Statutorily-recognized lists of rare and endangered species are produced at the federal level by the U.S. Fish and Wildlife Service under 50 CFR 23 and 50 CFR 17. At the state level the Florida Fish and Wildlife Conservation Commission protects endangered, threatened, and species of special concern under 39-27.003-.05. The Florida Department of Agriculture and Consumer Services provides specific protection for plants that are endangered, threatened, or commercially exploited under Chapter 5B-40 of the Florida Administrative Code. The Florida Natural Areas Inventory (FNAI) also produces a list of rare and endangered species, and maintains a database of occurrences of these species in Florida.

FNAI lists 29 types of plants, 66 vertebrates, and 4 invertebrates as rare or endangered in Citrus County. Within the preserve, FNAI has documented occurrences of 0 types of plants, 1 mammal, 8 birds, 3 reptiles, 0 amphibians, 0 fish, and 0 types of invertebrates. FNAI has documented a total of 25 occurrences of these various organisms within the preserve (Appendix 7). Listed species tracking and surveys will continue at the preserve. From other sources, preserve staff have documented an additional 6 types of listed species that are present on the preserve.

FNAI qualifies their data by stating that the data should not be used as a substitute for actual field work, as many areas FNAI covers have not been adequately surveyed. Surveys conducted by staff for rare and endangered species include small mammal trapping, herptile arrays, species area curves, and direct observation. Based on natural community types present in the preserve and the species reported to be in this county by FNAI, preserve staff estimate an additional 16 or more listed species potentially occur within the preserve.

The most notable among the species known to occur on the preserve are the West Indian manatee (*Trichechus manatus*), Florida black bear, (*Ursus americanus floridanus*) eastern indigo snake (*Drymarchon corais couperi*), eastern diamondback rattlesnake (*Crotalus adamanteus*), gopher tortoise (*Gopherus polyphemus*), Florida scrub jay (*Aphelocoma coerulescens*), sandhill crane (*Grus canadensis pratensis*), whooping crane (*Grus americana*), bald eagle (*Haliaeetus leucocephalus*), many-flowered grass pink (*Calopogon multiflorus)*, Southeastern myotis (*Myotis austroriparius*), saltmarsh mink (*Mustela vison halilimnites*), worm-eating warbler (*Helmitheros vermivorus*), magnificent frigatebird (*Fregata magnificens*), American avocet (*Recurvirostra americana*), wood stork (*Mycteria americana*), least tern (*Sterna antillarum*) and black rail (*Laterallus jamaicensis*).

Listed Plant Species

There are 13 species of listed plants known to occur on the preserve (Table 4). FNAI occurrence and tracking reports indicate 29 species of vascular plants listed for Citrus County. Based on the vast size of the preserve, the potential for other listed plants to occur is great.

The most notable among the listed plant species known to occur on the preserve is the endangered many-flowered grass pink, *Calopogon multiflorus*. This endangered species was documented on 04/02/03 from a single observation by preserve staff. The many-flowered grass pink has not yet been documented in the FNAI managed areas tracking record and is ranked G2G3 and S2S3. Populations of these orchids are found in flatwoods where fire naturally occurs every 3 to 10 years. This orchid is a fire-respondent species and populations generally consist of only a few plants. The single plant documentation was located with in a management unit last burned in 1999. Occurrence of this species has declined dramatically primarily due to habitat loss and the absence of fire. Land management areas and the use of prescribed burning as a tool is vital for this species to proliferate.

Six of the thirteen listed plant species are threatened due to commercial exploitation. These include greenfly orchid, giant leather fern, cinnamon fern, royal fern, needle palm and Florida coontie. Other listed plant species include the Catesby's lily, cardinal flower, netted chain fern, gypsy spikes and yellow butterwort. Most of these plants are associated with or are found in close proximity to wetlands.

Table 4. Listed Plant Species Known or Reported on the Crystal River Preserve State Park					
Common Name	**Scientific Name**	**Federal Listing**	**State Listing**	**FNAI State Ranking**	**FNAI Global Ranking**
Giant leather fern	*Acrostichum danaeifolium*		C		
Many-flowered grass pink	*Calopogon multiflorus*		E	S2S3	G2G3
Greenfly orchid	*Epidendrum conopseum*		C		
Catesby's lily	*Lilium catesbaei*		T		
Cardinal flower	*Lobelia cardinalis*		T		
Prickly pear cactus	*Opuntia stricta*		T		
Cinnamon fern	*Osmunda cinnamomea*		C		
Royal fern	*Osmunda regalis*		C		
Yellow butterwort	*Pinguicula lutea*		T		
Gypsy spikes	*Platanthera flava*		T		
Needle palm	*Rhapidophyllum hystrix*		C		
Florida coontie	*Zamia pumila*		C		
Atamasco lily	*Zephyranthes atamasco*		T		

E = Endangered, T = threatened, C = commercially exploited

Listed Animal Species

Mammals

The West Indian manatee, ranked as G2, S2 by FNAI, typically does not reside within the preserve, but all along its periphery as this species is commonly observed in the Crystal and Homosassa Rivers as well as Citrus County's estuarine waters. Manatees are the biggest tourist draw in the City of Crystal River. This is especially true during the winter months when manatees inhabit warm spring-fed waters. The preserve protects the manatee mainly by limiting coastal development. Presence of the long-tailed weasel is based on a single observation. Other mammals that have been observed by staff and have not been documented in the FNAI managed areas tracking record include Southeastern shrew and Gulf salt marsh mink. Observations of Sherman's fox squirrels have declined over the past five years. This may be directly related to observed road kills on US 19 as that highway divides habitat both on and off the preserve that is desirable by this species.

A radio-collared black bear, ranked G5T2, S2 by FNAI was released on the preserve, but tracking indicated it crossed the boundary soon thereafter and never returned. Originally, the bear was struck by a car on a road that borders the preserve. The hub of activity of most collared black bears in the region is immediately to the south of the preserve so it is reasonable to assume that they make occasional forays into the preserve. No other observations have been recorded.

Birds

The Crystal River Preserve State Park harbors more listed bird species (27) than any other class of vertebrates. Many are migratory species, which benefit from the expanse of the preserve as it serves as an important stopover or staging area in the spring and fall months. While bald eagles may be sighted year-round, they are common during the winter months when migrating birds utilize the region as a breeding ground. The FWC 2000 census determined that there were 5 active eagles nests within the bounds of the preserve.

Some resident birds utilize the preserve as nesting habitat. The St. Martins Keys and several of the fringing mangrove islands provide significant nesting sites for brown pelicans, little blue herons, snowy egrets, tricolored herons and yellow-crowned night herons.

Florida scrub jays are ranked G3, S3 by FNAI and are also state and federally listed as threatened. Scrub jays have very specific habitat requirements that have become degraded throughout Florida due to fire exclusion and habitat destruction. Florida scrub jays have been observed at the northern limit of the preserve. These birds are usually seen perched on power lines that border the preserve and occasionally noted within the boundary. At the time of

acquisition (August 26, 1999), the ecological habitat in that area was scrub, but its state was not conducive to habitation by scrub jays. Since that time nesting surveys have been conducted and in the fall of 2001 thirty-three acres were roller chopped and subsequently burned in January of 2002. To date these are the efforts that have been expended to restore the scrub habitat to a condition that will support the foraging and breeding activities of the scrub jays. A separate scrub/scrub jay management plan (Appendix 8) has been enacted to enable appropriate land and species management practices.

In the fall of 2000, thirteen sandhill cranes, ranked G5T2T3, S2S3 by FNAI, wintered on the preserve. These birds were led to the preserve from Wisconsin behind an ultra light aircraft as part of the whooping crane recovery project in an effort to establish another migratory population. In the fall of 2001 seven federally endangered whooping cranes were led to the Chassahowitzka National Wildlife Refuge, which rests immediately south of the preserve (Map #4). Every fall starting in 2002, more whooping cranes have made the trip and cranes returning from previous years have occasionally foraged and/or roosted on the preserve.

Reptiles and Amphibians

The most imperiled reptile listed occurs not within the preserve, but in the estuarine and marine waters immediately adjacent to it. The Kemp's ridley (*Lepidochelys kempii)*, ranked G1, S1 by FNAI, and green sea turtles are both listed as endangered by state and federal agencies. Like the manatee, both species benefit from the preserve by having a significant amount of the coastline unavailable for development. Currently, Citrus County's coast supports lush seagrass beds, a staple of the sea turtles' diet. The other listed reptile of note is the American alligator (*Alligator mississippiensis)*, ranked G5, S4 by FNAI, is state and federally listed as threatened by similarity of appearance. This species is abundant on the preserve and is sighted frequently in a variety of aquatic and wetland habitats.

Eastern indigo snakes and eastern diamondback rattlesnakes are ranked G4T3, S3 and G5, S3, respectively, by FNAI. Eastern indigo snakes are also federally and state listed as threatened. Both of these snakes are becoming increasingly rare in Florida due to destruction of habitat and persecution by humans. These snakes are also associated very strongly with gopher tortoises, ranked G3, S3 by FNAI, which are also becoming rare due to habitat destruction by humans. These snakes utilize gopher tortoise burrows for refugia and for thermoregulation, especially during periods of cold weather. Eastern indigo snakes and eastern diamondback rattlesnakes are important predators of small mammals, helping to keep their populations in balance. Gopher tortoises are important keystone species with dozens of commensal species utilizing their burrows for refugia. Tortoises are typically found on well-drained, deep, sandy soils in a variety of habitats such as sandhill, mesic flatwoods, upland mixed hammocks, scrub, scrubby flatwoods, and a variety of ruderal and successional habitat types. Prescribed fire can be used as a tool to maintain tortoise habitat and adequate herbaceous food.

Fishes

Declines in fisheries stock during the 1970s and 1980s led to the designation of the common snook, *Centropomus undecimalis*, as a Species of Special Concern by the state. Common snook are an estuarine dependent, euryhaline, stenothermic species, limited in their range by the winter 15°C isotherm. The Crystal River Preserve State Park lies at the northern-most extent of the their range. Common snook may not occur within the area from one year to the next, depending on the severity of winter. Common snook are protandrous hermaphrodites, which, in southeastern and southwestern Florida, aggregate to spawn in passes between barrier islands during the summer. Early juveniles reside near overhanging, vegetated shorelines of freshwater and marine environments (Peters et al., 1998). Adults may occur in freshwater river systems, estuaries, and nearshore marine environments. Common snook are an extremely important recreational species in southeast and southwest Florida. A snook fishery within Citrus County is essentially nonexistent.

The oppossom pipefish is a threatened species. It is an anadromous fish with permanent populations limited to tropical and subtropical areas. Opossum pipefish have been consistently collected from southeastern Florida. There have been no specimens collected from the preserve or Citrus County. However, their range is thought to extend throughout the Gulf of Mexico. Mating pairs found in south Florida are highly dependent on emergent freshwater vegetation such as *Panicum* spp. and *Polygonum* spp. Individuals have also been collected from *Spartina* marshes in Mississippi. Post-larval and early juveniles are thought to reside offshore in floating mats of *Sargassum*, which are common in many areas of the Crystal and Homosassa rivers.

Table 5. Listed Animal Species Known/Reported on the Crystal River Preserve State Park or in Adjacent Waters					
Common Name	**Scientific Name**	**USFWS Listing***	**FWCC Listing†**	**FNAI State Listing‡**	**FNAI Global Listing‡**
Fish					
Common snook	*Centropomus undecimalis*	-	SSC	-	-
Reptiles					
American alligator	*Alligator mississippiensis*	T(S/A)	SSC	S4	G5
Atlantic green turtle	*Chelonia mydas mydas*	E	E	S2	G3
Eastern diamondback rattlesnake	*Crotalus adamanteus*	-	-	S3	G4
Eastern indigo snake	*Drymarchon corais couperi*	T	T	S3	G4T3
Gopher tortoise	*Gopherus polyphemus*	C	SSC	S3	G3
Kemp's ridley turtle	*Lepidochelys kempii*	E	E	S1	G1
Gulf saltmarsh water snake	*Nerodia clarkia clarkii*	-	-	S3?	G4T3
Suwannee cooter	*Pseudemys concinna suwanniensis*	-	SSC	S3	G5T3
Florida scrub lizard	*Scleroporus woodi*	-	-	S3	G3
Birds					
Cooper's hawk	*Accipiter cooperii*	-	-	S3	G5
Roseate spoonbill	*Ajaia ajaja*	-	SSC	S2	G5
Scott's seaside sparrow	*Ammodramus maritimus*	-	SSC	S3	G4T3
Florida scrub jay	*Aphelocoma coerulescens*	T	T	S2	G2
Limpkin	*Aramus guarauna*	-	SSC	S3	G3
Great egret	*Ardea alba*	-	-	S3	G5
Marian's marsh wren	*Cistothorus palustris*	-	SSC	S3	G5T3
Little blue heron	*Egretta caerula*	-	SSC	S4	G5
Reddish egret	*Egretta refesens*	-	SSC	S2	G4
Snowy egret	*Egretta thula*	-	SSC	S3	G5
Tri-colored heron	*Egretta tricolor*	-	SSC	S4	G5
Swallow-tailed kite	*Elanoides forficatus*	-	-	S2	G5
White ibis	*Eudocimus albus*	-	SSC	S4	G5
Merlin	*Falco columbarius*	-	-	S2	G5
Peregrine falcon	*Falco peregrinus*	E	E	S2	G4
Southeastern kestrel	*Falco sparverius paulus*	-	T	S3	G5T4
Whooping crane	*Grus americana*	LE, XN	SSC	SXC	G1
Magnificent frigate bird	*Fregata magnificens*	-	-	S1	G5
Florida sandhill crane	*Grus canadensis pratensis*	-	-	S2S3	G5T2T3
American oystercatcher	*Haematopus palliatus*	-	SSC	S2	G5
Bald eagle	*Haliaeetus leucocephalus*	T	T	S3	G4
Worm-eating warbler	*Helmintheros vermivorus*	-	-	S1	G5
Least bittern	*Ixobrychus exilis*	-	-	S4	G5
Black rail	*Laterallus jamaicensis*	-	-	S2	G4
Wood stork	*Mycteria americana*	E	E	S2	G4
Black-crowned night heron	*Nycticorax nycticorax*	-	-	S3	G5
Yellow-crowned night heron	*Nyctanassa violacea*	-	-	S3	G5
Osprey	*Pandion haliaetus*	-	-	S3S4	G5
Brown pelican	*Pelecanus occidentalis*	-	SSC	S3	G4
Hairy woodpecker	*Picoides villosus*	-	-	S3	G5
American avocet	*Recurvirostra americana*	-	-	S2	G5
Black skimmer	*Rhynchops niger*	-	SSC	S3	G5
Louisiana water thrush	*Seiurus motacilla*	-	-	S2	G5
American redstart	*Setophaga ruticilla*	-	-	S2	G5
Least tern	*Sterna antillarum*	-	T	S3	G4
Royal tern	*Sterna maxima*	-	-	S3	G5
Sandwich tern	*Sterna sandvicensis*	-	-	S2	G5
Mammals					
Florida long-tailed weasel	*Mustela frenata peninsulae*	-	-	S3	G5T3
Gulf saltmarsh mink	*Mustela vison halilimnetes*	-	-	S3	G5T3
Southeastern bat	*Myotis austroriparius*	-	-	S3	G4
Florida mouse	*Pedomys floridanus*	-	SSC	S3	G3
Sheman's fox squirrel	*Sciurus niger shermani*	-	SSC	S3	G5T3
West Indian manatee	*Trichechus manatus*	E	E	S2	G2
Florida black bear	*Ursus americanus*	-	T	S2	G5T2

* E = Endangered, T = Threatened, T(S/A) Threatened by similarity of appearance; † E = Endangered, T = Threatened, SSC = Species of special concern; ‡ refer to Appendix 4 for explanation of global and state ranks

Invasive Non-native Species

At least 18 plant and 11 animal invasive, non-native species are known to occur within the Crystal River Preserve State Park (Tables 6 & 7). According to the Florida Exotic Pest Plant Council (FLEPPC), 14 of these plant species are considered Category I and four are considered Category II invasive exotics (2003 list). Category I invasive plant exotics alter native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. This definition does not rely on the economic severity or geographic range of the problem, but on the documented ecological damage caused. Category II invasive exotics are those that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. Florida does not have an official invasive non-native animal species list, but at least 270 exotic animal species are known to occur in Florida.

The most serious of the invasive non-native animal species are the feral pig *(Sus scrofa).* Feral pig populations are high at the preserve and their impacts are obvious and severe. Feral pigs are extremely destructive when rooting in the damp soils of natural biological communities and are a threat to rare and endangered plant and animal species. They are capable of out-competing native animals such as deer, turkey, squirrel, and wood duck. These animals also prey on wildlife such as small mammals, eggs of ground nesting birds, gopher tortoises, and herptofauna. Feral pigs can create severe ground disturbance, opening a niche for invasion by invasive exotic plant species. The Crystal River Preserve State Park has a comprehensive feral pig control program that will be addressed in Chapter IV.

Feral cats (*Felis familiaris*) have been observed at various times and locations on the preserve. The extent of feral cat infestation on the preserve is currently unknown. However, since they can breed rapidly and are efficient predators of small mammals, herptiles, and birds, staff will remove feral cats whenever they are encountered.

Table 6: Invasive Non-native Animals of the Crystal River Preserve State Park

Common Name	Genus	Species	Degree of Infestation
Brown anole	*Anolis*	*sagrei*	Medium
Domestic dog	*Canis*	*familiaris*	Medium
Coyote	*Canus*	*latrans*	Low
Muscovy duck	*Carina*	*moschata*	Low
Rock dove	*Columba*	*livia*	Low
Armadillo	*Daspys*	*novemcinctus*	Medium
Greenhouse frog	*Eleutherodactylus*	*planirostris*	Low
Domestic cat	*Felis*	*silvestris*	Medium
Mediterranean gecko	*Hemidactylus*	*turcicus*	Low
House sparrow	*Passer*	*domesticus*	Low
Fire ants	*Solenopsis*	*spp.*	Low
Eurasian collared dove	*Streptopelia*	*decaocto*	Medium
European starling	*Sturnus*	*vulgaris*	Medium
Feral pig	*Sus*	*scrofa*	High

Degree of infestation: LOW = a few isolated individuals (no negative impacts observed), MEDIUM = established (potentially breeding, but not a major biological threat), HIGH = an established infestation (breeding, major biological threat)

Invasive non-native plants on the preserve pose a serious threat to ecosystem function and integrity. The distribution of the invasive non-native plant species on Crystal River Preserve State Park is shown on Map #11. Brazilian pepper *(Schinus terebinthifolius)* and cogon grass (*Imperata cylindrica)* are the two most widespread and ecologically destructive of these plants. Brazilian pepper tends to invade primarily cedar-cabbage palm hammocks, coastal berms, coastal high marsh, and shell islands disturbed by the March 1993 No-Name Storm. This storm produced a surge of up to eight feet, effectively opening a niche for invasion by this prolific plant species that has invaded over 500 acres on the preserve. Staff is aggressively fighting this invasive exotic plant through both contract and in-house treatment regimes.

Cogon grass has the potential to take over vast areas of the Crystal River Preserve State Park if left unchecked. Currently it is found primarily along power line rights of way and roads, but the potential exists for it to rapidly colonize pine flatwoods, oak-cabbage palm hammocks, and ecotonal areas. Cogon grass is capable of spreading over vast distances by windborne seeds. Due to its resistance to fire, burning is not a viable treatment option.

Exotic plants can quickly invade a natural community and overtake it, choking out native plants, eventually resulting in a monoculture. Habitats invaded by exotic plants are often impaired in hydrological function, severely reduced in biodiversity, ecosystem function, and offer little or no habitat value to native wildlife.

Table 7: Invasive Non-native Plant Species Known to Occur on Crystal River Preserve State Park

Scientific Name	Common Name	FLEPPC Cat.	Gov. List	Degree Of Infestation
Albizia julibrissin	mimosa, silk tree	I		Low
Casuarina equestifiloia	Australian pine	I	**P**	Low
Colocasia esculenta	wild taro	I		Low
Doiscorea bulbifera	air-potato	I	**N**	Medium
Eichhornia crassipes	water-hyacinth	I	**P**	Medium
Hydrilla verticillata	Hydrilla	I	**P, U**	Medium
Imperata cylindrida	Cogon grass	I	**N, U**	Medium
Ligustrum sinense	Chinese privet, hedge privet	I		Low
Lygodium japonicum	Japanese climbing fern	I	**N**	Low
Melia azedarach	Chinaberry	I		Low
Nephrolepis cordifolia	sword fern	I		Low
Nephrolepis multiflora	Asian sword fern	I		Low
Paederia foetida	skunk vine	I	**N**	Medium
Sapium sebferum	popcorn tree, Chinese tallow	I	**N**	Low
Schinus terebinthifolius	Brazilian pepper	I	**P, N**	High
Myriophyllum spicatum	Eurasian water-milfoil	II	**P**	Medium
Pteris vittata	Chinese brake fern	II		Low
Urena lobata	Caesar's weed	II		Low
Xanthosoma sagittifolium	malanga, elephant ear	II		Low

FLEPPC Cat. =Florida Exotic Pest Plant Council Category. Category I invasive plant exotics alter native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. Category II invasive exotics are those that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species.
Gov. list: P = Prohibited by Fla. Dept. of Environmental Protection, N = Noxious weed listed by Fla. Dept. of Agriculture & Consumer Services, U = Noxious weed listed by U.S. Department of Agriculture.
Degree of infestation: LOW = a few isolated individuals (found on less than five acres), MEDIUM = an established infestation less than 100 acres, but with great potential for spreading, HIGH = an established infestation of more than 100 acres

Problem Species

Invasive non-native species are not the only species that can cause problems within an ecosystem. Sometimes man's activities in an area can result in native species becoming a disruptive influence, or a native species may have what appear to be unnatural effects on a system, such as pine beetle epidemics killing large areas of healthy pines.

The only species that is considered to be a problem at Crystal River Preserve State Park are non-native invasive species. No native species are considered to be problematic at the preserve.

Forest Resources

Sustainable forestry is an important component of Florida's economy and can provide funds for management of lands. Chapter 253, Florida Statutes, requires that plans for 1,000+-acre parcels contain an analysis of multiple-use

potential, to include a professional forester's assessment of the resource conservation and revenue-producing potentials of the tract's forests. DRP considers forest management consistent with the purposes for acquisition of this property when the activities contribute to restoration management. A Timber Management Assessment was conducted for the preserve on August 9, 2002, and is included as Appendix 9.

Prior to acquisition by the state, many areas of the Crystal River Preserve State Park were intensively managed for timber and cattle production. Past timber harvesting and naval stores activity is still evident throughout the area. On the Hollins tract, most of the suitable ground was clearcut of a majority of the native pines, site-prepared and replanted with North Florida slash pine in the early 1970's. Primarily, trees left standing were too small, crooked, or deformed to be useful as saw timber, although small pockets of native slash and longleaf pines still remain, especially in or around wet areas and hammock lands. Some saltmarsh islands were bedded and planted at the same time as the original planting. These stands are chlorotic and declining. Neither the Williams nor the Sterchi properties appear to have received any timber management activities in over 50 years.

Most native pine areas are not large enough or have enough volume to allow commercial timber harvest on their own. Therefore, they should be thinned in conjunction with nearby plantation operations. Prescribed burning and possibly roller-drum chopping may be needed to control the understory vegetation (especially saw palmetto). If the palmettos are to be chopped, some pine trees may have to be removed to facilitate the operation.

There have been two selective timber harvests within the plantations, one in the spring of 2000 and the other in late 2001. These cuts targeted only planted slash pine and were designed to dramatically open the canopy to allow for the planting of longleaf and loblolly pines as well as the regrowth of the insipient seed bank of herbaceous vegetation. To date roughly 250 acres have been treated with selective cuts. Not only have timber activities improved the quality of the habitat they have generated income for the preserve and have been dedicated to the management of timber resources and restoration projects.

A very dense stand of mixed age longleaf pine occurs just inside the entrance off of U.S. Highway 19 on the Sterchi Tract. This stand needs to be thinned. Removing some of the trees in this fashion will facilitate safe prescribed burning and promote good growth in the remaining trees. A portion of the sandhill community has a dense mid and overstory of turkey oaks (*Quercus laevis*) and blue-jack oaks (*Quercus incana*) which hinder longleaf pine regeneration and shade out native ground cover plants. While always a component of this ecosystem, their numbers have increased dramatically with the exclusion of growing season fires. These trees can be reduced to more reasonable numbers through the application of herbicides or with springtime prescribed burning.

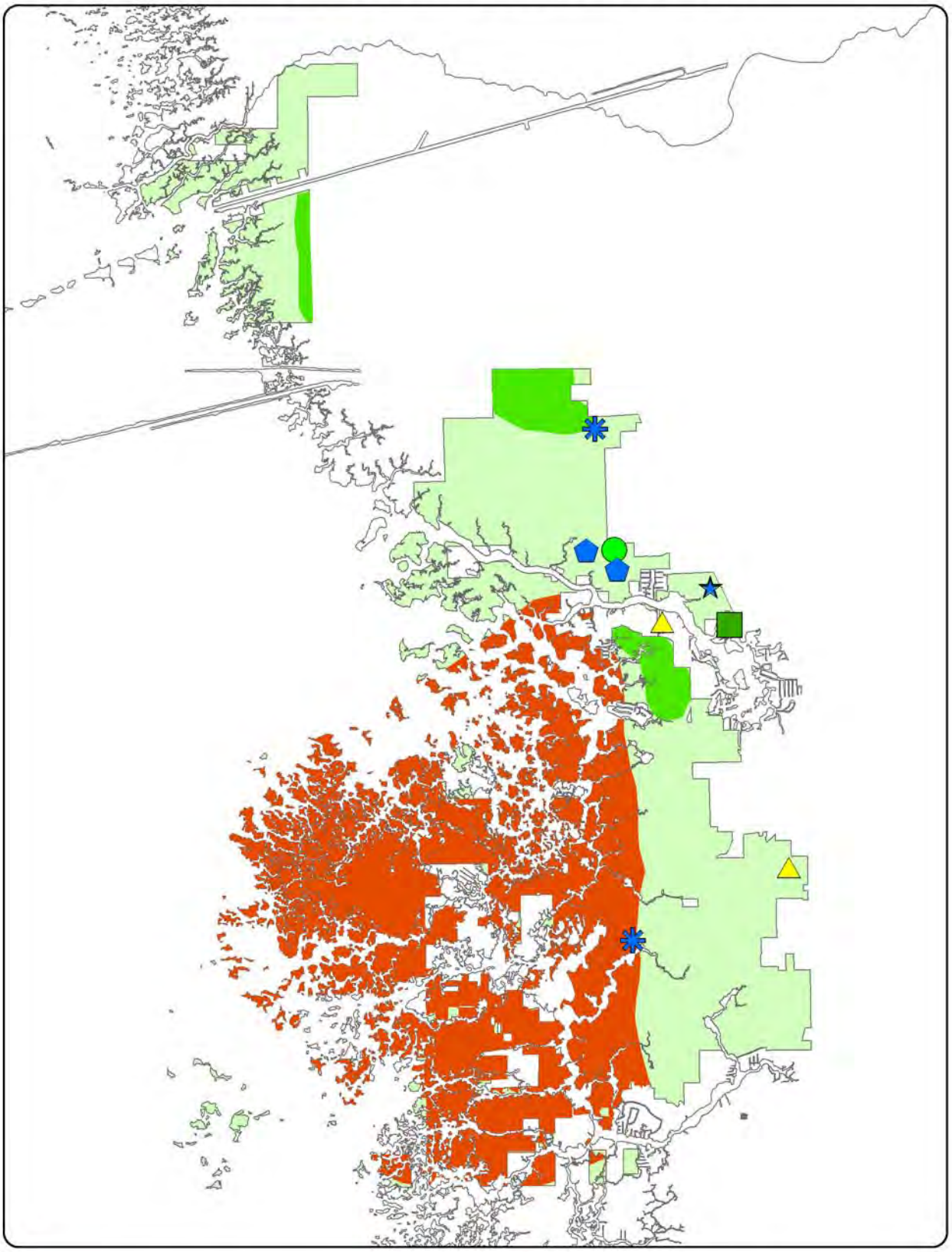
Reestablishment of native pine trees is essential to restoring healthy flatwoods ecosystems to Crystal River Preserve State Park. Reintroduction of periodic fire is another requirement of these systems. The needles, annually shed by native pine trees, are an important carrier of fire in Florida's forests. Success of the prescribed burning program will likely depend on the ability of managers to continue growing pine trees. Timber sales are used to maintain vigorous stands of pine trees and maintain more open canopies. Revenues from these timber sales can make a significant contribution toward management expenses on the preserve.

A fire management plan is included in Appendix 10 and also addresses forest resources.

Mineral Resources

Minerals of commercial interest within the preserve are lime rock and shell deposits, which have value as both fill and for concrete products. Several old quarry pits throughout the preserve attest to the past use of these deposits for road fill. The remaining extent of these deposits within the preserve is unknown. Alternative sources of these materials are readily available from existing privately owned pits nearby. The old quarry pits are large and include areas along Powerline Road, N. Sailboat Ave, and Ozello Trail. The pits near N. Sailboat Avenue are utilized as a popular fishing area known as the Mullet Hole. The pits along Powerline Road are known as the Quarry and offer additional fishing opportunities via a spur off the Eco Walk. The remaining large pits are open to the public for fishing but since these pits are deep with steep shoreline drop-offs, they offer no littoral vegetation and little quality fish habitat. Plans for enhancement of these large pits are discussed elsewhere in this plan.

Map #11: Invasive Non-native Plant Species Locations on the Crystal River Preserve State Park



Crystal River Preserve State Park
Brazilian Pepper (light, locally heavy: treated)
Cogongrass (scattered: treated)
Japanese Climbing Fern (Lygodium japonicum)
Air Potato (Dioscorea bulbifera): treated
Caesarweed (Urena lobata)
Chinaberry (Melia azedarach)
Chinese Tallow (Sapium sebiferum): treated
Skunkvine (Paederia foetida): treated

N

1 0.5 0 1 Miles

Archaeological, Cultural, and Historical Resources

Florida's coastal areas, especially uplands contiguous with water, often have a rich history of human settlement. The Florida Department of State, Division of Historical Resources (DHR) maintains a Master Site File that documents many of Florida's archaeological and historical features. Appendix 11 lists the 289 known recorded archaeological sites on the Crystal River Preserve State Park. We can project that many hundreds more unrecorded sites may exist on managed lands. Many of these sites are currently buried by natural coastal actions and an unknown number are submerged. At least 500+ documented culturally significant sites are known to exist on lands surrounding Crystal River, with more being added each year. Inventories have been conducted for a few of those sites. The cultural history of the area attests to a long occupation of the coastal strand from the Paleoindian to historic Seminole. The local cultural sequence has been described and includes Paleoindian, Archaic, Transitional/Orange, Deptford, Swift Creek, Weeden Island, Safety Harbor, and the historic Seminole. Contact Period or Acculturative sites reflecting Spanish-Indian contact or effect are limited to the eastern side of Citrus County. No known contact period sites are present within the Crystal River Preserve State Park. Site types vary by cultural tradition, but the range includes simple resource acquisition sites, campsites, habitation, villages, ritual mound, burial mound, quarry and lithic reduction sites. The majority of sites within the coastal strand have a shell midden. Upland terrestrial sites range from earth and shell to earth middens. Underwater sites and sites with an underwater component follow the estuarine model and are primarily shell midden-based.

The Crystal River Preserve State Park has an archaeological team (Gulf Archaeology Research Institute, GARI) that, in exchange for leased office space, assists in locating, identifying, and developing strategies to conserve cultural resources. GARI is experienced in undertaking cultural-ecological research and its multi-disciplinary staff has a strong understanding of the natural and cultural resources along the coast. Also, all management staff are trained in methods to identify possible new cultural sites. The presence of GARI, whose staff includes archaeologists, biologists, and physical scientists, allows for continuous dialog on management issues and practices to permit the best fit for management applications. During normal management activities and while conducting regular border patrols, staff routinely assesses cultural sites to determine if any acts of looting or natural processes, such as erosion, are affecting the sites. This process has proven to provide a measure of on-going protection that is both uniform and normal.

Management authority for these areas does not lie exclusively with DRP but must be closely coordinated with the Department of State's Division of Historical Resources (DOS/DHR). Natural resource management activities, such as prescribed burning, exotic plant removal, and public access to these areas are currently being conducted without altering the integrity of these sites. Vandalism by pot hunters has been an ongoing problem, and early detection of this type of activity is essential to bringing it under control. The preserve has previously engaged Gulf Archaeology Research Institute (2001) to essentially restore five potentially significant archaeological sites (8Ci417, 419, 1076, 1089, and 1090) affected by vandalism and natural actions. Restoration activities included stabilizing vandal excavation holes, restoring stratigraphic contexts, and controlled re-vegetation. These actions have largely saved these sites from further degradation and provided a standard for coastal/estuarine restoration and protection. All five sites are currently under the watchful eye of preserve staff and law enforcement to minimize vandal access and physical impacts.

Exotic wildlife (hogs, armadillos) and exotic invasive plants, as well as some native plants, also present potential damaging forces to the cultural resources. Exotic animal and plant removal is carried out with full cognizance of the fragile nature of these resources.

Scenic Resources

The variety of natural community types of the preserve lend to its visual appeal. In particular, the property's extensive marshes, rivers and freshwater features provide opportunities for scenic vistas. Wildlife viewing opportunities are abundant and the preserve is a popular birding destination. The preserve has been designated an Important Birding Area by the National Audubon Society and is included as a destination on the FWC Great Florida Birding Trail.

III. Use of the Property

Previous Use and Development

Many of the upland areas of the preserve were subject to logging activities at one time. Longleaf and loblolly pine were cut and utilized for construction material. Also several of the remaining large pines have "cat faces" which indicated that turpentine production was also a traditional use of the property that is now the preserve. In addition to timber harvests, the Hollins tract was used to ranch cattle and for an exclusive hunting club. Limited limestone mining also occurred on some northern sections of the preserve. Wetlands were also logged in some areas of the preserve, as evidenced by large stumps of cut cypress and black gum. In coastal hammocks, southern red cedar was harvested to support pencil factories in Crystal River and Cedar Key. As early as the late 19th and early 20th centuries the Crystal River was home to a booming tourism industry based on hunting and fishing with several hunting leases located on areas that were to later become parts of the Crystal River Preserve State Park.

Current Public Use and Land Uses

There are multiple public access points on the preserve, which provide varied recreational opportunities. The focal point of much public use is the visitor center where dioramas, live displays, and a native landscape garden may be observed. The visitor center also has literature about other access points on the preserve and serves as an excellent location for people to see the Crystal River. Picnic tables are available for visitors who wish to eat outdoors and enjoy the river. There is a floating dock in the boat basin outside the office/visitor's center that is sometimes utilized by eco-tour operators who tie up there in order to bring their fares to the visitor's center.

Currently, there are five trailheads on the preserve (Map #12). Most hikers frequent the EcoWalk Trailhead, located off Old Tallahassee Road, where one can access the 2.2-mile EcoWalk Trail or the 9-mile Loop Trail. There are two trailheads off Sailboat Avenue, the road leading to the office/visitor center. The northernmost provides access to the southern end of the Loop Trail and the other access to the 1.5 mile Boy Scout Trail and the approximately 1.5 miles of trails around the Crystal Cove Day Use Area (more commonly referred to as the Mullet Hole Fishing Area). One trailhead serves the Churchhouse Hammock Trails and can be found on US 19 directly across from the Crystal River Mall. This trailhead is furnished with a pavilion, two composting toilets, pervious concrete walkways and bicycle parking. One of the trails (.5 mile) is a boardwalk loop and, along with the trailhead, is entirely ADA compliant. The second trail (1 mile) is a loop connected to the Boardwalk Trail, and is a simple footpath. With the exception of the Loop Trail, all trails are designated for foot traffic only. Bicycles are permitted on the Loop Trail. Departure and return to all trailheads may be done in a loop-wise manner. The trails provide excellent opportunities to spot wildlife, bird watch, photograph plants and generally commune with nature. The Dixie Shores Trailhead is located off the Fort Island Trail (CR 44W) and provides no amenities.

There are three areas within the preserve that are designated as public fishing areas (Map #12), with a fourth possible area to be designated in the future. The Crystal Cove Day Use Area, or Mullet Hole Fishing Area, is accessed from Sailboat Avenue. Here the preserve receives the majority of its visitors. Fishing for mullet is the popular pastime for people who frequent this area. On-site composting toilets and a parking area near the water make the Mullet Hole Fishing Area a desirable fishing spot for many. A parking area for the Redfish Hole is found along Fort Island Trail (CR 44W) and the fishing area is reached by following a half-mile path. There are no amenities at this location, but many users of this area come to hike rather than fish. There is a spur trail off the EcoWalk Trail, which leads to an old limestone quarry. Visitors must hike nearly two miles with their equipment if they wish to fish this spot. Finally, three lakes located along trails in the Dixie Shores area could offer an area for freshwater fishing and will be designated with signs in the future.

The EcoWalk Trail, the trails associated with the Crystal Cove Day Use Area, the trails off Dixie Shores Blvd., Fort Island Trail (CR 44W) and the Kings Bay and Salt River paddling trails have all been designated part of the Great Florida Birding Trail and are identified in the brochure for trails in the project's western section. Fort Island Trail runs through the preserve and provides two locations where birders may stop and walk trails within the preserve. The preserve borders both the paddling trails partly or nearly entirely.

As the Hollins parcel is the largest contiguous uplands parcel within the preserve, most resource management, monitoring, and research activities occur here. A large part of this parcel is subject to prescribed fire and selective timber harvests (in slash pine plantations) as part of the preserve's restoration efforts. Public use areas are closed when these land management practices are on going. Resource management activities include: small mammal, bird, and herptofauna surveys; assessments of vegetation biomass, diversity and density; and measures of tree production and density. Similar, but less frequent, resource management practices occur on the Sterchi and AHR parcels.

Facility list:

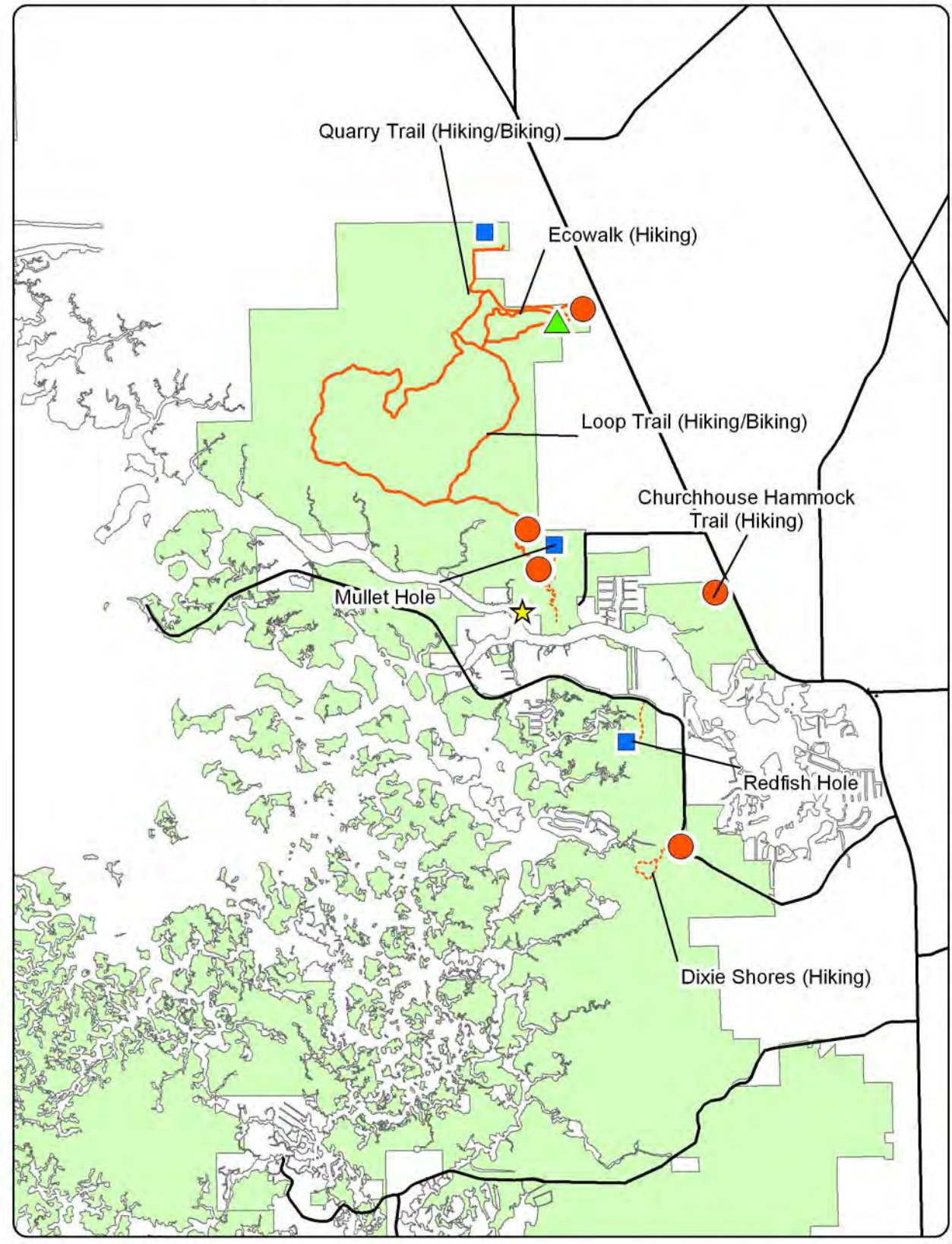
- 4 Composting Toilets
  - Mullet Hole (2)
  - Churchhouse Hammock (2)
- 6 Buildings
  - Administrative Office/Visitor Center (with 2 restrooms)
  - GARI Office (2 buildings, with 1 restroom)
  - Visiting Scientist Quarters
  - Shop
  - Shop Office
  - On-site Residence
- 9 Sheds/Storage Buildings
  - 2 Quonset Huts (Shop)
  - 7 sheds (Shop and Administrative Office)
- 8 Docks
- 4 Designated Fishing Areas
  - Mullet Hole
  - Redfish Hole
  - The Quarry
  - Dixie Shores (to be designated with signs in the future)
- 6 Designated Trails (4 trailheads for 6 trails- Eco Walk and Loop Trail share 2 trailheads)
  - Loop Trail
  - Eco Walk
  - Eagle Scout Trail
  - Mullet Hole Trail
  - Churchhouse Hammock Boardwalk
  - Dixie Shores
  - Churchhouse Hammock Primitive Trail
- 8 Parking Areas
  - Loop Trail/EcoWalk North Trailhead
  - Loop Trail/EcoWalk South Trailhead
  - Eagle Scout/Mullet Hole Trailhead
  - Churchhouse Hammock
  - Mullet Hole
  - Redfish Hole
  - Dixie Shores Trailhead
  - Administrative Office/Visitor Center

Planned Uses and Assessment of their Impacts

Determination of Public Uses that are Consistent with Acquisition Purposes

Public uses of Crystal River Preserve State Park must follow the statutory requirements of the program(s) under which they were acquired, the management policy statement, and the management prospectus. In addition, they must comply with Chapter 62-D, FAC, the rule that guides operation of recreation areas and facilities on DRP managed lands. According to the 2003 Florida Forever plan, the intended public use of this property is to provide scenic areas in which the public can enjoy fishing, hiking, or learning about the natural world of this coast. Uses planned for Crystal River Preserve State Park comply with the Conceptual State Lands Management plan and

Map #12: Current Public Uses and Facilities of the Crystal River Preserve State Park



represent "balanced public utilization" and are detailed below under "Planned Public Uses and Assessment of Impacts" and "Analysis of Multiple-Use Potential". Uses other than those approved below must be reviewed and approved by DRP in advance of such use.

Planned Public Uses and Assessment of Impacts

Four projects are planned for fiscal year 04/05. The first is the construction of a canoe/kayak launch to provide access to the Crystal River. The preferred location is at the office/visitor's center facility (Map #13). The specific placement of this project will be on the NE corner of the boat slip leading into the Crystal River. This project will require the placement of a small floating launch in the basin that is designed to rise and fall with the changing tides. The location of the proposed canoe/kayak launch is a highly disturbed shoreline site comprised of lime rock fill brought in when the office/visitor's center was originally constructed as a fish house. No impervious surfaces will be created. Salt myrtle and cattails have volunteered along the shoreline and will only be displaced where the ramp passes over. There is no submerged aquatic vegetation of any kind in the basin so the launch will not shade out any plant life. During placement of the launch a floating silt barrier will be installed to avoid increasing turbidity levels in the Crystal River and manatee protection regulations will be adhered to, such as posting a lookout when construction activity occurs in the water. The Southwest Florida Water Management District will be the regulatory agency in charge of permitting requirements for the proposed canoe/kayak facilities and lines of communication will be kept open to insure full compliance. Consideration will also be given to designating a site along the shoreline of the Mullet Hole for additional canoe/kayak access in the future.

The second planned project is the construction of a boardwalk from the primitive Churchhouse Hammock trail to the bank of the Crystal River (Map #13). This proposed boardwalk will be approximately 700' from end to end with a width of five feet for a total of 3,600 $ft.^2$ (including the terminal platform). The aim of this boardwalk is to enhance the experience of the Churchhouse Hammock trail and give visitors a view of the marsh and Crystal River from an altogether unique perspective. The plan is to have the boardwalk begin in a broadleaf hammock adjacent to the sawgrass marsh that borders the Crystal River. It will then stretch over the marsh, skirt the edge of a hammock island and terminate in a viewing platform overlooking the Crystal River at Bagley's Cove. Plans call for the boardwalk to increase in height as it crosses the marsh, return to 2' above grade on the island and gradually rise in height to the viewing platform. This will give visitors an opportunity to see the hammock island at mid-canopy height and have a vantage point to view Bagley's Cove. The platform will be designed so as not to extend over the bank and into the river. There will be some temporary wetland impacts in the low edges of the hydric hammock and the sawgrass marsh, as large poles will have to be driven into the substrate to support the boardwalk. However, the height of the boardwalk should eliminate most shading effects on the marsh, allowing sunlight beneath it save when the sun is directly overhead. There is very little ground cover landward of the marsh. These steps should minimize impacts to the resource and preserve the natural feel of the area. The Division of Historical Resources will be contacted to insure no impacts to cultural or historical sites and GARI will conduct an investigation of the area. A permit will be submitted to and the Southwest Florida Water Management District will determine regulatory requirements.

The third project will be an equestrian trail on land adjacent to the Cross Florida Greenway. The entrance and trailhead facilities are planned to be located on the Greenway. Further details of this are located in Chapter IV.

The fourth project will be the construction of a boardwalk at the Dixie Shores Trail no more than 150 meters long. All required wetland permits will be obtained prior to construction. This boardwalk will cross a section of saltmarsh that will enable visitors to traverse to an upland section with additional opportunities for hiking through a variety of habitats. This boardwalk will also stop any potential disturbance of sensitive marsh vegetation from foot traffic as well as providing visitors with an enhanced view, as the boardwalk will be five foot above grade in accordance with wetland permitting requirements.

Adjacent Land Uses

For a representation of adjacent land uses, refer to Map #14. Most land uses adjacent to the preserve are not in direct conflict with the public use or management of the property. Developed areas like the towns of Crystal River, Ozello and Homosassa Springs pose a threat to the preserve in that they are continual sources of non-native invasive plant species. Brazilian pepper is the most notable of these species as this plant grows thickly in the yards of several homeowners whose lots abut the preserve. In others areas of interface between the preserve and private property, the dumping of yard waste is common. This poses a fire hazard on the boundary and is another vector by which non-native invasive plants may gain a foothold.

In some cases private lands adjacent to the preserve are being used for access to poach either wildlife or driftwood. This primarily occurs between Ozello and Homosassa. On many occasions staff have found area of freshly cut driftwood and observed a stack of freshly cut pieces across the preserve's boundary. Many times if someone is present on the private property they claim to have permission of the property owner. This office continues to work with State and local law enforcement to curtail these problems.

Potential Surplus Lands

All of the lands within the Crystal River Preserve State Park are suitable and necessary for the stated management objectives and none should be considered or declared as surplus.

Prospective Land Acquisitions

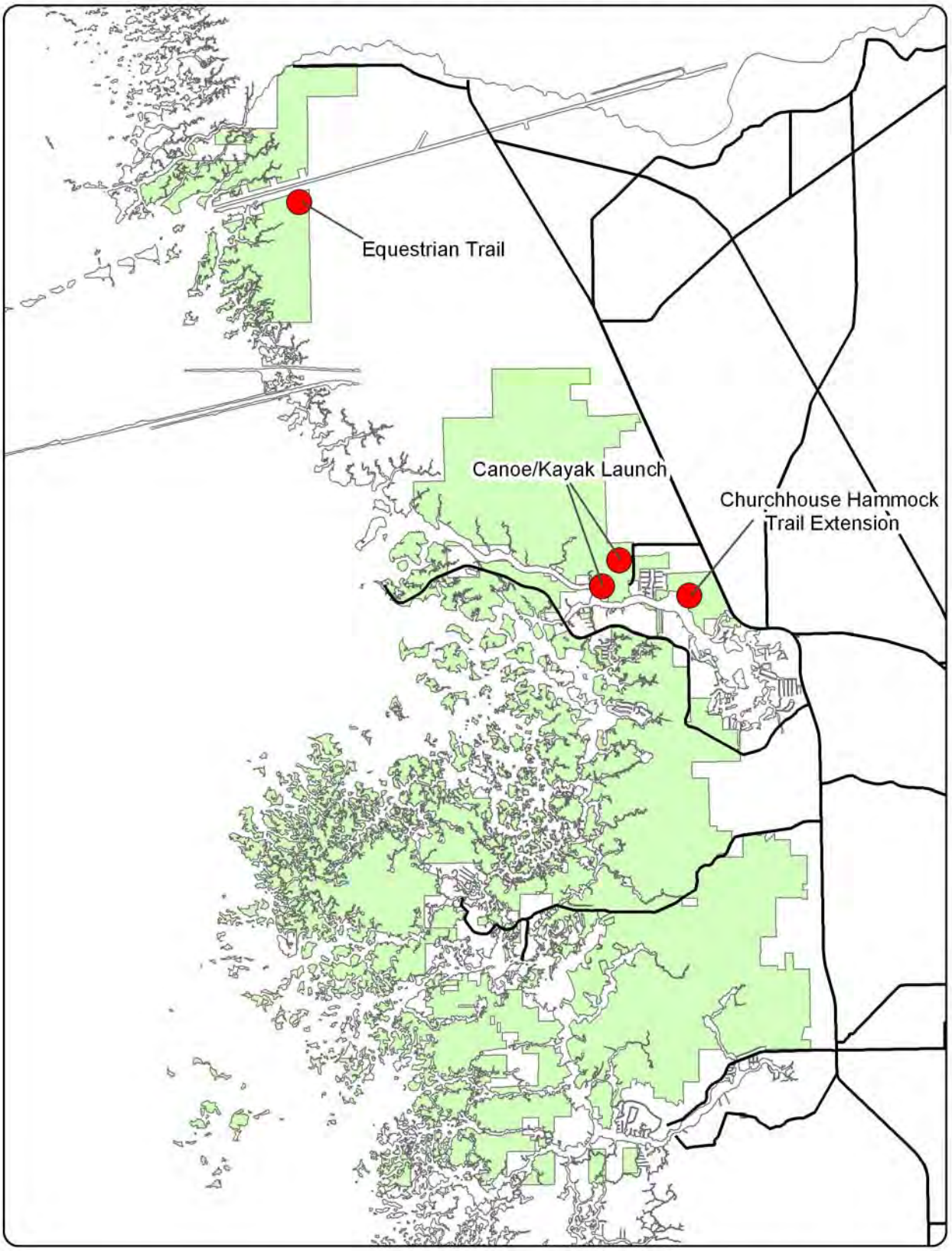
Not all lands within the Florida Forever project boundaries for Crystal River Preserve State Park have been acquired, and some of the remaining acquisitions are more important than others. Council members and staff involved in the evaluation of CARL and, now, Florida Forever applications develop project boundaries based on numerous factors, primarily related to the natural and cultural resources of a project. After a project is acquired, management staff is often able to assess the natural resource and management needs of a preserve in more detail. Oftentimes a change or potential change in surrounding land use or the necessity to provide additional facilities indicates the original boundaries are not sufficient to ensure the preserve's perpetual protection. Staff identified a number of properties totaling 1,140 acres that are not contained within the Florida Forever project boundary but considered important to be managed as part of the preserve.

Map #15 shows those areas both within and outside the FF project boundaries that have been identified as part of the optimum boundary of the preserve. These lands provide a buffer from surrounding development/activities, possess high natural resource values, provide a more manageable property boundary, provide linkage to other state-owned lands or private conservation lands, provide public access, and are significant for fire management. Areas of highest priority are indicated on the map and listed in Appendix 12. The priority list is to be used as a guide for acquisition planning and not intended to limit the acquisition of other parcels within the optimum boundary if opportunities arise. Staff will pursue amending the current Florida Forever project boundary to include all areas considered important for management as part of the preserve.

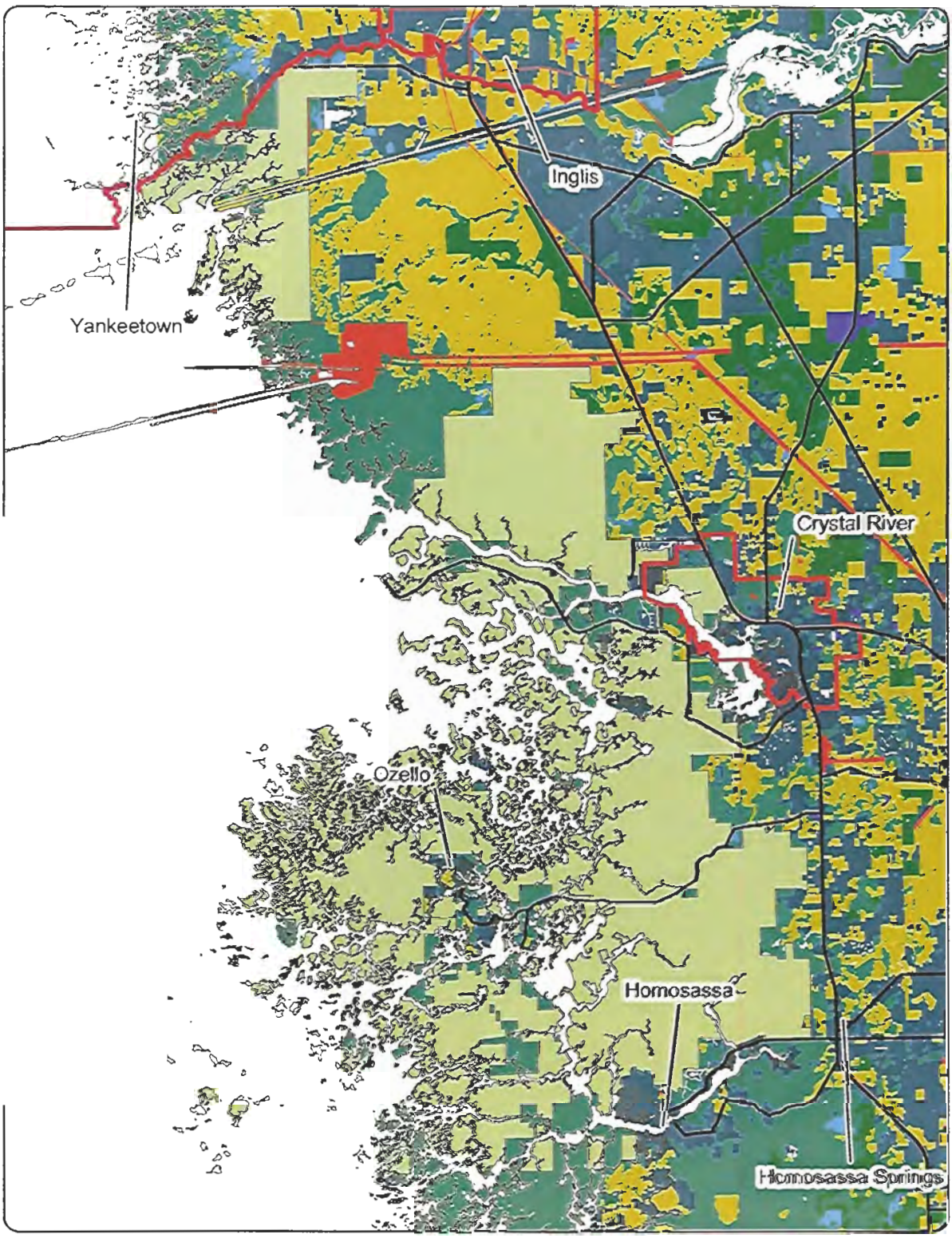
As additional needs are identified through preserve use, development, and research, and as adjacent land uses continue to change on private properties, the optimum boundary for the preserve may be modified for the enhancement of natural and cultural resources, recreational values, and/or management efficiency.

Identification of prospective land acquisitions is solely for planning purposes and not for regulatory purposes. A property's identification as a prospective acquisition is not meant to be used by any party or other government body to reduce or restrict the lawful right of private landowners. Identification of these lands does not empower or require any government entity to impose additional or more restrictive environmental land use or zoning regulations. Identification is not intended to be used as the basis for permit denial or the imposition of permit conditions.

Map #13: Proposed Public Uses and Facilities of the Crystal River Preserve State Park



Map #14: Land Use Map for the Area Surrounding the Crystal River Preserve State Park



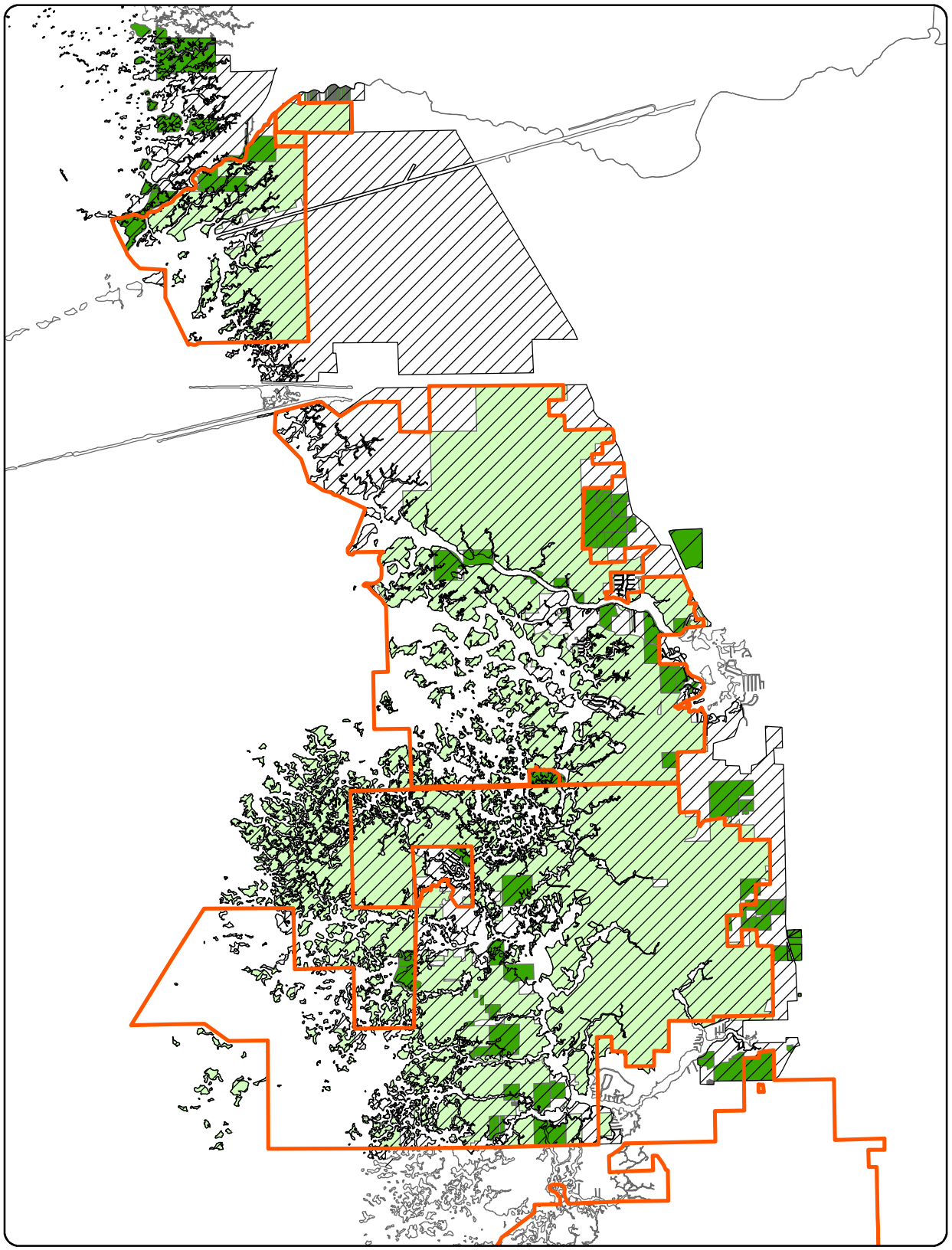
Crystal River Preserve State Park
Cities

Land Use

Agriculture
Barren Land
Infrastructure
Rangeland/Scrub
Upland Forests
Urban and Built-Up
Wetlands

Miles
0 0.5 1 2

Map #15: Proposed Land Acquisitions



Crystal River Preserve State Park
Priority Acquisitions
Optimum Boundary
Florida Springs Coastal Greenway Florida Forever Project

N

0 0.5 1 2 Miles

Analysis of Multiple-Use Potential

In the development of this plan, the potential of the preserve to accommodate secondary management purposes ("multiple uses") was analyzed. These secondary purposes were considered within the context of the DRP's statutory responsibilities, purpose for acquisition and an analysis of the resource needs and values of the preserve. This analysis considered the natural and cultural resources, management needs, aesthetic values, visitation, and visitor experiences of the preserve. It was determined that timber management could be accommodated in a manner that would be compatible and not interfere with the primary purpose of conservation, preservation and compatible resource-based recreation. This compatible secondary management purpose is addressed in the Forest Resources section of the plan. Uses such as water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the preserve and should be discouraged.

The potential for generating revenue to enhance management was also analyzed. It was determined that timber management would be appropriate at the preserve as an additional source of revenue for land management since it is compatible with the primary purpose of conservation and resource-based recreation. In addition, techniques such as entrance fees and similar measures will be employed on a case-by-case basis as a means of supplementing management funds.

IV. Management Issues, Goals and Objectives

Central to the management of Crystal River Preserve State Park are the purposes of the land acquisition programs through which the preserve was acquired, and the intent for its acquisition. These are described, followed by a summary of accomplishments under management by CAMA as a state buffer preserve during the past five years. Goals and objectives for the preserve over the next 10 years are addressed in the next section. Each management subject area is addressed, starting with a brief description of pressing issues, if any. A discussion of needs for the subject area follows, and the intended management direction and activities are described. At the end of each section the pertinent goals and objectives are listed. Many of the goals and objectives apply to more than one subject area. In this case, the goals and objectives are placed in the subject area that seems most appropriate. Goals and objectives for all subject areas are also presented in one table in Appendix 13.

Program Framework and Goals

State Buffer Preserve Program

Crystal River Preserve State Park was originally purchased for management as a State Buffer Preserve. The State Buffer Preserve Program began as an extension of the Florida Aquatic Preserve Program. Aquatic preserves are state-owned submerged lands that are legislatively designated and directed to be maintained in their natural or existing conditions. However, protection of aquatic preserves is difficult because they only provide for limited control of activities on the submerged lands and the water body. The greatest influence on the condition of most water bodies is the type and extent of land use in the watershed of those waters. Acquisition of remaining natural lands surrounding aquatic preserves and other significant coastal waters is essential to the protection of the aquatic preserves. The State Buffer Preserve Program was initiated to provide additional control over lands that directly influence aquatic preserves.

CARL/Florida Forever Acquisition Programs

Properties within the Florida Springs Coastal Greenway project were identified for acquisition to protect the resources of the Citrus County coastline that were threatened by explosive growth of this part of the state. Originally a CARL project and now a Florida Forever project, the purposes for public ownership are outlined in Chapters 259.032(3) and Chapters 259.105 F.S., respectively. The intent of the CARL statute is to conserve and protect environmentally unique and irreplaceable lands that contain native, relatively unaltered flora and fauna representing a natural area unique to, or scarce within, a region of Florida or a larger geographic area, and to provide areas, including recreational trails, for natural resource based recreation and other outdoor recreation on any part of any site compatible with conservation purposes. The intent of the Florida Forever statute is to acquire environmentally sensitive lands, restore damaged environmental systems, assist with water resource development and supply, increase natural resource-based public recreational and educational opportunities, manage and maintain public lands, and provide increased protection of land by acquisition of conservation easements.

According to the Florida Forever management prospectus, the purpose for state acquisition of properties within the Florida Springs Coastal Greenway are to conserve the natural landscape of this coast, protecting the water quality of the spring runs and estuaries where endangered manatees congregate, preserving natural lands that link with conservation lands to the south, and providing scenic areas in which the public can enjoy fishing, hiking, or learning about the natural world of this coast. Primary goals of management are: to conserve and protect significant habitat for native species or endangered and threatened species; to conserve, protect, manage, or restore important ecosystems, landscapes, and forests, in order to enhance or protect significant surface water, coastal, recreational, timber, fish or wildlife resources which local or state regulatory programs cannot adequately protect; to provide areas, including recreational trails, for natural-resource-based recreation; and to preserve significant archaeological or historical sites.

Desired Future Conditions

It is the goal of the Crystal River Preserve State Park to resemble natural conditions, before large scale anthropogenic changes altered the preserve. These desirable conditions would resemble pre-European settlement. This would involve a natural hydrologic regime, return of a natural fire regime, and no impact by exotic species. Long-range plans for this property will generally be directed at the perpetuation of natural communities and protection of listed species. An all-season burning program will use existing roads, black lines, foam lines and natural breaks to contain fires. Areas of silviculture will be returned to their original character and species composition.

Future development is to be restricted to the minimum necessary for ensuring resource protection and maintenance, limited access, user safety and appropriate interpretation. Permitted public uses will be of a passive nature, related to the aesthetic, educational and appropriate recreational enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Interpretive program emphasis will be placed on the natural and cultural attributes of the preserve.

Major Accomplishments for the Crystal River State Buffer Preserve During 1997-2003

The major accomplishments at the preserve over the past five years center largely around public access, outreach and education (Table 8). There were also notable resource and species management achievements. Moving into a new and more visible office location in 1998 was a major factor in the preserve's ability to reach a large audience. Increase use of the preserve over the past five years has demanded improvements to and expansion of public access opportunities. The higher profile of the preserve has also increased requests for staff to participate in and develop education and outreach programs. Significant thought has been given to the establishment of a resource management program that provides staff with the ability to determine both positive and negative changes in the environment and adjust activities accordingly. A suite of monitoring programs has been developed to meet this need.

Table 8: Major Accomplishments for the Crystal River State Buffer Preserve during 1997-2003	
Accomplishment	**Year(s)**
Partner in whooping crane reintroduction. Conducted forage study with Texas A&M, provided the logistics and place for sandhill cranes to winter in 2000/2001 and participated with USFWS in the preparations for the whooping cranes in 2001 & 2003. Staff was recognized by USFWS for their efforts.	1997-2003
Initiated large flatwoods restoration program including selective timber harvest and multifaceted monitoring program that includes species-area curves, vegetation biomass, point-centered quarters, canopy coverage, photo points, point counts for birds, herptile monitoring and small mammal transects. The monitoring programs allow staff to make scientifically informed management decisions on the restoration of the preserve. Restoration activities have occurred on over 200 acres of the preserve.	1999-2004
Began "Redfish Revue" night. This is a very popular outreach program done monthly for environmental education. Participants view a movie and staff leads a discussion on the topics relevance to the preserve.	2001-2004
The Governor in an official proclamation of "School's Out" Day recognized the buffer preserve. "School's Out" is a program that allows school aged children to come to the visitor's center, see the displays and touch tanks, get an overview of the preserve and then take a guided boat tour of the Crystal River.	2001
The preserve hosted a "Roots & Shoots" group from Tanzania. "Roots & Shoots" is an outreach organization for youth who have an interest in the natural world. It is part of Dr. Jane Goodall's overall outreach program. The Tanzanian children were introduced to the local ecology through presentations, boat rides and species collections. The trip received a large amount of media attention.	2001
The preserve organized and hosted a 24-hour wildlife observation event called BioBlitz. The event was advertised and staff gave a variety of tours all over the preserve to learn about and observe wildlife from insects to mammals. Attendance was high and there was excellent press coverage.	2000
Three locations on the preserve were designated as part of the Great Florida Birding Trail. Staff had coordinated with FWC personnel and volunteers for several years to make this happen.	2002
Public access was dramatically improved. Usership of the EcoWalk hiking trail has increased every year. The Loop Trail was outfitted with additional and improved informational and directional signage. The Crystal Cove Day Use Area was developed and opened to visitors who wished to hike or fish. This day use area garners more visitors than any other location on the preserve. Garbage around the Redfish Hole Fishing Area and trail was removed and the area is maintained regularly. By the end of 2002 the Churchhouse Hammock trails were opened to the public.	1997-2002
Preserve staff moved into a new office located on the banks of the Crystal River. Staff redesigned the interior of the existing building to include office space, common areas, a conference room, working laboratory and a visitor's center. The visitor's center includes dioramas, live displays, touch tanks, Ecoventures and a variety of literature. A native landscape garden was developed immediately outside of this office. Visitation to this facility increases annually.	1998
A feral hog removal program was started and 400+ of these destructive non-native animals have been removed from the preserve.	1998-2004
The National Audubon Society named the preserve as an "Important Bird Area".	2001
1,317 acres were prescribed burned. 574 acres were prescribed burned more than once.	1997-2003
17,000 acres of exotic plants were treated including; Brazilian pepper, cogon grass, skunk vine, and Chinese tallow. Over 95% control of exotic species has been achieved.	1997-2004
Scrub jay management/scrub restoration plan was completed for the preserve.	2002
A Timber Management Assessment was completed through the Florida Division of Forestry (this was a recommendation from the Land Management review team).	2002
Large box culverts were installed to enhance the flow along two natural creeks on the Hollins parcel as part of a wetland mitigation project. Previously, there had been very small pipe culverts that were not sufficient to allow adequate tidal flushing of the creeks. Since the box culverts were installed, vegetation has responded rapidly.	2002

Goals and Objectives for Crystal River Preserve State Park During 2004-2013

Goals and objectives were developed specifically for the Crystal River Preserve State Park based on the purposes for which the lands were acquired, the condition of the resources present, and management issues for the property. In developing these, goals and objectives of the previous plan were reviewed to determine if they remain meaningful and practical and should be included in the updated plan. The goals and objectives presented here reflect programmatic goals and the ideas of personnel in charge of managing and protecting the area, as well as input from cooperative managers, user groups and other stakeholders from outside the DEP. The agency believes the goals and objectives to be consistent with the various forms of guidance provided to managers.

Management issues related to the resource categories described in Chapter II, as well as other important management topics, are discussed below in separate sections. Within each section, approaches for dealing with these issues are described. At the end of each section, goals and objectives related to those issues are listed, as well as other objectives essential to the section. Appendix 13 presents all the goals and objectives in a table, along with timelines and, if available, estimated costs to accomplish management actions on the preserve, as required by Florida Statutes. Objectives are listed in priority order under each goal. The ability to implement the specific goals and objectives identified in this plan is dependent upon the availability of funding resources for these purposes.

Resource Management and Protection

Soil Management

Previous land uses, hydrologic alterations, and fill removal/placement have affected portions of all the management units of the preserve. In areas where large-scale disturbance has taken place, soil horizons may be intermixed and/or totally absent as a result of earth moving, erosion, or oxidation processes. These disturbed areas frequently have altered floral and faunal components than would typically occupy the same areas without disturbances. Any proposed activities in the preserve must consider these consequences with appropriate management steps taken to prevent soil erosion.

Soil erosion is currently not a problem at Crystal River Preserve State Park. However, areas that receive heavy public visitation (e.g., the Mullet Hole) may become eroded over time. Also, staff will remain vigilant to new soil erosion from major disturbances such as storms.

Goal 1: Manage soil to reduce and prevent erosion
Objective 1a: Assess the preserve to identify major erosion areas and implement control measures as needed.

Hydrology/Water Management

Through use of historical aerial photography and interpretation of natural communities staff has a basic understanding of natural flow-ways and how they have been affected over time by anthropogenic changes. Staff will continue to study and assess these changes through use of soil coring and topographic surveys. When funding allows, restoration will proceed with priority given to areas that support listed species or rare communities and can be reasonably enhanced or restored.

Several deep borrow and limestone pits are present on the preserve. Although water quality in these pits is good, they provide little habitat for fish and wildlife due to very steep shoreline drop-offs. Contingent upon funding, these pits will be graded with slopes and littoral shelves to provide bedding areas for fish and appropriate water depths for emergent vegetation which, will provide habitat for wildlife including waterfowl and herptiles.

There are also specific plans to enhance the Quarry along Powerline Road. This plan is called the Quarry project. Currently the Quarry consists of two deep pits with no littoral shelf and a shallow pit which supports limited emergent vegetation. Between, the deep and shallow pit is a woods road. Contingent upon funding, this road will be graded down so that the shallow and deep pits will connect to provide enhanced aquatic habitat for aquatic plants

and animals. The fill that will be removed from the road will be placed in the deep pits to raise the bottom resulting in shallower areas of the pit, which will also enhance aquatic habitat and reduce presence of a hypoxic zone.

Other shallow borrow pits are present on the preserve and have substantive habitat values for many species of frogs and other amphibians. These species have larvae that are very susceptible to predation by fish. Due to the fact that these shallow pits harbor no fish (due to no hydrological connection or periodic natural desiccation) they are excellent habitat for frogs and other amphibians.

Many areas of the preserve have either modified natural waterways or ditches, which have modified natural hydrologic regimes. One of the most effective hydrological restoration techniques is installation of water control structures ("box" culverts, ditch blocks, tidal gates, weirs, etc…) in historical flow-ways that have been altered or diverted. These culverts will be installed in locations that meet the following criteria:

- It can be demonstrated that no flooding will occur offsite without permission of the landowner.
- Installed water control structures will transport similar volumes of water to the historical natural regime.
- A reasonable hydrologic regime can be expected.
- In-house personnel can conduct maintenance of the structure.
- To specifically manage for listed species or a natural community.
- Listed species or rare natural communities will not be harmed by restoration actions.

Goal 2: Maintain/restore natural flow ways and protect water quality

Objective 2a: Inventory hydrological changes to the preserve (ditching, plugging, dams, spoil deposition, etc.) and their impacts and formulate restoration actions.

Objective 2b: Restore/enhance known areas of dredge spoil (borrow pits/riverbank/shoreline/spoil islands) where applicable and when funding allows.

Objective 2c: Assess corrective measures needed for ditched areas on the preserve.

Objective 2d: Restore 50% of major hydrological alterations in the preserve (5%/year) by 2013 and complete the Quarry project by 2008.

Natural Communities Management

Extensive alteration of natural topography, hydrology, and vegetation has disrupted species and altered natural processes in portions of the preserve. Fire suppression, hydrological manipulation, agriculture, silviculture, residential/commercial development, mosquito control, and the introduction of exotic (non-native) plants and animals have encroached upon, or completely eliminated, the former processes or species that once occupied certain parts of the preserve. The extent to which an area has been modified is assessed, and some determination of whether to restore or not restore must be made with practical consideration for cost, effectiveness, relevance to the surrounding habitat, and the overall net benefit to the resource and ecosystem. Maintenance of existing habitats through prescribed fire also requires extensive preparation, staff training, specialized equipment, and management time.

Activities that are currently being implemented and/or considered include the following: reintroduction and maintenance of fire regime; hydrological restoration of ditches and former drainage systems that are no longer fully functional; exotic plant and animal removal; and species manipulation (reintroduction of plant and/or animal species, reseeding, mowing).

The preserve is currently in the process of acquiring sets of historic aerial photography. Once acquired, staff will interpret the aerials to determine extent of habitat change due to fire exclusion and hydrology changes. Using this information staff will adjust management regimes to mimic natural historic conditions.

Basin Marsh This habitat type covers 418 acres. This community is adapted to frequent fires and long hydroperiods. Therefore, this community will be managed to simulate natural conditions with frequent prescribed fires and every effort made to maintain or restore the natural hydrologic regime.

Basin Swamp The basin swamp community covers 348 acres at Crystal River and in general exhibits good health. The hydroperiod for this community is typically 200-300 days. Therefore, this community will be

managed to simulate natural conditions with every effort made to maintain or restore the natural hydrologic regime.

Borrow pits (unclassified) These are borrow pits filled with water and surrounded by the preserve. All of these areas were mined for limestone prior to purchase by the state. Just 79 acres of the preserve is covered by these borrow pits. Some of these borrow pits are large and deep enough to support fish and game fish. In these areas public fishing is allowed. Restoration of these large borrow pits would be extremely expensive and would reduce public fishing opportunities. Where possible (contingent upon funding) some areas of shorelines will be graded to construct a littoral shelf and allow easier access for public fishing. Many other small, shallow pits are the result of borrowing for construction of limerock trails. While these areas are artificial, they have few or no predatory fish and are therefore important for amphibians and reptiles.

Developed The portion of the preserve that is classified as developed is the 5 acres that include the office, visitor center, parking lot and boat yard.

Dome Swamp This natural community covers only 31 acres. The hydroperiod for this community is typically 200-300 days. Prescribed fire will only be applied to surrounding communities when there is still residual water in the center of this habitat. In this manner the edges can be maintained to prevent conversion to another community type and hardwood invasion, while a damaging muck fire is prevented.

Floodplain Forest This community type is found only in the northernmost section of the preserve and it covers 143 acres. This community will be managed to simulate natural conditions with every effort made to maintain the natural hydrologic regime. Development in adjacent and upstream areas will be monitored for potential impacts such as impoundments, river diversion, pesticide use, and intensive agriculture.

Floodplain Swamp This habitat type covers 389 acres of the preserve and grades into floodplain forest. As with floodplain forest, this community will be managed to simulate natural conditions with every effort made to maintain the natural hydrologic regime.

Freshwater Tidal Swamp This community type covers 299 acres of the preserve. This habitat is present along the Crystal and Homosassa Rivers and may flood up to twice per day. Little management is needed to maintain this community except for preventing wetland filling projects.

Hydric Hammock This is the second most common habitat on the preserve covering 3,734 acres. Restoration of hydrologic regimes is needed in many areas where roads or trails have disrupted historic flow-ways and hydroperiods and is addressed in other sections of this plan.

Marsh (Prairie) Hammock Marsh hammock habitat covers the third largest area of the preserve at 2,823 acres. Many areas of this habitat have become infested by Brazilian pepper and skunk vine. Management of this habitat will revolve around exotic species management. Prescribed fire will help to maintain these areas once the exotics are controlled.

Mesic Flatwoods Mesic flatwoods occupy 1,166 acres and is the largest upland community type on the preserve. Much of this habitat is pine plantation with large stands of planted off-site slash pine in dense, even-aged stands. This is being converted back to a more natural flatwoods community with longleaf pine through the use of selective thinning and prescribed fire. Longleaf pine may also be planted to supplement natural recruitment from donor trees left on-site.

Ruderal The areas of the preserve that were prepared for development and ultimately purchased by the state are described as ruderal. These areas have been dedicated for public use (fishing) and cover 117 acres of the preserve.

Sandhill Sandhill is the smallest natural upland community represented on the preserve. It accounts for only 41 acres. Much of this community type has been planted with slash pine, some of which has already been selectively thinned as part of a habitat restoration effort. Thinning will continue along with the continuation of prescribed fire to control hardwoods that have encroached into this habitat.

Scrub This xeric habitat comprises 292 acres and is located at the north end of the preserve. The scrub has suffered from fire exclusion for many years and as a result has become overgrown and poor scrub jay habitat. Management here will revolve around prescribed fire and fuels management. Roller chopping will be used in concert with prescribed fire to reduce hardwoods, reduce canopy cover, and open up floor space that scrub jays need for caching of acorns. A scrub burn is planned for 2004 that will simulate a natural, intense scrub fire. Several prescribed fires may be necessary on some parcels to achieve a more timely restored condition. By 2008 all scrub (292 acres) at Crystal River will have been burned at least once since 2004.

Scrubby Flatwoods This community type is covers 946 acres. As with scrub, this community type has suffered from fire exclusion and the resulting encroachment of hardwoods. Management here, like the scrub, will revolve around prescribed fire and fuels management.

Spoil The 57 acres coverage of spoil is associated with past dredging activities for the Cross Florida Barge Canal (now the Cross Florida Greenway). This habitat is sparsely vegetated and requires little management.

Tidal Marsh At 16,903 acres, estuarine tidal marsh covers more area than any other on the preserve. Due to the importance of this community type for nursery habitat for a wide range of marine life, storm surge buffering capacity, and pollutant filtering actions, this may be the most important habitat that found on site. This habitat is in fair to good health. Management of this habitat will revolve around maintenance of existing conditions through prescribed fire. Coordination with SWFWMD and DEP ERP programs to minimize dredge and fill projects is also important.

Tidal Swamp This community type represents the mangrove islands and fringes of the preserve. It accounts for 1,747 acres. These mangrove islands and fringes provide rookery and roosting habitat for several species of birds. This community requires no fire and the only management needed is coordination with SWFWMD and DEP ERP programs to prevent any destruction of this habitat. This habitat will also need to be closely monitored to prevent invasion by exotic species.

Upland Mixed Forest This natural community type is found over 237 acres. Much of this habitat was previously other habitats such as sandhill, and conversion to upland mixed forest is the result of fire exclusion. Hardwood encroachment in these areas is extensive and prescribed fire will be used as a restoration tool. Historical aerials will be used to guide this effort.

Wet Prairie This habitat covers 190 acres of the preserve. Traditionally, this acreage was used to graze cattle and through the years the tree density has increased and native grasses have expanded their coverage. The pasture is the location of two trailheads and one complete trail. This habitat provides some of the best migratory bird habitat on the preserve. Frequent prescribed fires are being used here to maintain a rich diversity and an open canopy.

Goal 3: Restore, maintain and protect natural communities

Objective 3a: Complete a GIS map and description of FNAI natural communities and disturbed areas on the preserve (LMR recommendation).

Objective 3b: Identify historic vegetative community types of the preserve in order to restore habitats to the proper natural community composition (LMR recommendation).

Objective 3c: Develop quantifiable vegetative management objectives for the preserve to ultimately achieve desired future conditions for the area's natural communities (LMR recommendation).

Native Species Management

The DRP manages natural resources at the ecosystem level, with the assumption that proper management of ecosystems will provide for the needs of the myriad species that are part of each ecosystem. However, in order to properly manage for native species the preserve plans to inventory native plants and animals and assess their populations. This will enable the preserve to adjust management practices, if necessary, to manage for a specific species.

Goal 4: Maintain and protect the native species
Objective 4a: Inventory native plants found on the preserve and assess their population requirements
Objective 4b: Inventory native animals found on the preserve and assess their population requirements

Listed Species Management

While the DRP ecosystem management approach generally benefits listed species, there are times when management actions must be tailored to meet the needs of a particular species. An example is a natural community in poor condition, perhaps in conjunction with extreme circumstances such as drought. In this case, some species may not fare well and the continued survival of a species in the preserve may require specific efforts. DRP manages specifically for listed species as needed, in conjunction with ecosystem management activities.

Table 5 contains those listed animal and plant species occurring on, or expected to occur on the preserve. Listed species are those that are declining in Florida and/or nationally or are globally considered to be rare, endangered, threatened, species of special concern, or commercially exploited. Laws imposed by appropriate state or federal agencies to protect these species are strictly enforced. A top management priority is to maintain or increase existing populations of listed plant and animal species to ensure optimum ecological diversity and survival of the local populations of the species. Restoration of native plant communities, reestablishing fire regimes, and exotic plant control are all beneficial for the listed species. Careful timing and preparation for prescribed fires avoid listed species mortality.

Listed species monitoring (nests, burrows, foraging areas, and individuals) is conducted by preserve staff, volunteers, FWC, and USFWS. Preserve staff are also familiar with recovery plans for the appropriate species. Consultation with recognized authorities and scientists is also implemented to ascertain current management strategies or special needs of various species.

Due to the degraded nature of many habitats at the preserve from fire suppression and hydrological alterations, listed species will be managed through the use of prescribed burning, selective thinning, hydrological restoration, and species monitoring. The preserve, in concert with FNAI, plans to conduct additional surveys for listed species at Crystal River. A separate scrub management plan is included in Appendix 8 that addresses the management procedures for scrub jay habitat. The fire management plan is included in Appendix 10, which also details specific timing and type of prescribed fire that will be used to restore scrub jay habitat. Management for scrub jays will revolve around fuels management and prescribed fire in order to reduce canopy cover and open up ground space that scrub jays utilize for caching of acorns.

Goal 5: Maintain and protect the listed species
Objective 5a: Survey listed plant species and assess their population requirements and provide information to FNAI.
Objective 5b: Survey listed animal species and assess their population requirements and provide information to FNAI.
Objective 5c: Implement the scrub jay management plan.

Invasive Non-native Species Management

Staff prioritizes exotic pest plant control based upon several factors. The primary of these factors is whether the Florida Exotic Pest Plant Council (FLEPPC) lists the plant as a Category I or II exotic species. Other factors include, but are not limited to, density of infestation, potential habitats impacted, and relative rate of spread. Several FLEPPC Category I & II exotic plants have been documented at the preserve and factors such as surrounding residential development, climate change, and introductions of new species can be expected to increase the number of exotic species that invade Crystal River. The key to exotic plant management currently is based upon control, except where eradication is a feasible (time and money) option. For example, Brazilian pepper outlier trees are given extremely high priority for treatment to prevent monocultures from becoming established. Also, some species like Chinese tallow and cogon grass are only currently found in isolated populations and thus given a high level of prioritization for eradication to prevent spread to new areas. Locations of exotic plant infestation can be found on Map #11. These species are particularly troublesome FLEPPC Category I exotics that have been recently established or have shown the potential to spread rapidly.

Chemical treatment methods for exotic plant management are used at the preserve. These includes specific

"recipes" for certain species, e.g. Garlon 4 for Brazilian pepper and Rodeo for cogon grass.

At this time, the priority exotic pest plant impacting habitats is Brazilian pepper (*Schinus terebinthifolius*). Pepper has invaded large tracts of wetlands, particularly in prairie hammocks in saltmarsh areas in the central western areas of the preserve, and will continue to pose a threat to native landscapes from seed sources on private lands on the perimeter of the preserve. The preserve works closely with the DEP Bureau of Invasive Plant Management to coordinate removal and control of exotic plant species through cooperative funding partnerships.

Exotic invasive animal species pose more management challenges. Species such as feral hogs tend to move across the landscape in response to seasonal variations such as rainfall. Currently, staff controls hogs with the assistance of volunteers. The Crystal River Preserve State Park will pursue contractors to supplement in-house control of feral hogs.

Goal 6: Eradicate invasive non-native species or maintain at the lowest practical level

Objective 6a: Inventory invasive non-native species on the preserve.

Objective 6b: Coordinate with DEP Bureau of Invasive Plant Management (BIPM) to establish an exotic species operational plan for the preserve.

Objective 6c: Reduce and maintain exotic plant species to less than 5% cover and promote reestablishment of native species through seed bank recruitment.

Objective 6d: Reduce population of feral hogs by establishing a trapping program or other means as needed.

Problem Species Management

Currently the only species considered to be problematic at the preserve are invasive exotic species and they are addressed in other sections of this plan.

Forest Resources Management

Historically, before many areas were acquired by the state, they were used for silviculture. This, combined with fire suppression, has resulted in unnaturally high densities of off-site slash pine instead of longleaf pine. In 2002 DOF conducted a timber assessment of the Crystal River Preserve State Park. DOF recommended thinning to produce more natural tree spacing and natural age distribution to reduce competition with longleaf pines. To date roughly 250 acres have been treated with selective cuts. Not only have timber activities improved the quality of the habitat, they have generated income for the preserve and have been dedicated to the management of timber resources and restoration projects. DOF also recommended the introduction of prescribed fire to simulate natural processes and to reduce competition from hardwoods. Where fuel loads are too high to safely conduct prescribed burns, mechanical treatments (e.g. roller chopping) will be utilized to reduce fuel loading. The timber management assessment is located in Appendix 9. Timber sales monies will be used to supplement other land management operations such as exotic species management and fireline construction.

Goal 7: Manage forest resources consistent with the purposes of this property, when the activities contribute to restoration management

Objective 7a: Continue selective thinning to reduce competition from off site slash pine to restore longleaf pine (LMR recommendation).

Objective 7b: Utilize a combination of prescribed fire and mechanical treatments to reduce fuel loading to minimize the risk of damaging wildfires.

Mineral resources

Historically, some areas of the preserve were mined for mineral resources including sand and limestone. While some mineral resources may remain, mining for these resources is very destructive and therefore not compatible with the designated single use of the preserve.

Plans to enhance old mining pits in the preserve are discussed in the *Hydrology/Water Management section*. These plans call for grading shorelines of the pits to allow for increased littoral vegetation and improved aquatic habitat.

Fire Management

Prescribed burning is intended to mimic the conditions provided by a natural burning regime. The desire is to maintain plant community structure and biodiversity within the natural communities. The preserve is divided into 52 burn units, with a burn prescription for each unit. Fire management zones are indicated on Map 16 and Table 9 describes each burn zone of the preserve. The preserve's burn plan is updated yearly. All prescribed burns are conducted with authorization from the Department of Agriculture and Consumer Services, Division of Forestry (DOF). Wildfire suppression activities are coordinated between DRP and DOF. A fire management plan is included in Appendix 10 which details training and operations.

Goal 8: Conduct fire management operations to help restore and maintain natural communities and to mimic natural fire effects

Objective 8a: Develop burn plan with a GIS database for the preserve.
Objective 8b: Acquire necessary training and equipment for fire prescription and suppression.
Objective 8c: Install firelines to facilitate fire management.
Objective 8d: Accomplish the annual burn objectives listed in the burn plan.
Objective 8e: Coordinate with DOF to manage wildfires when they occur.
Objective 8f: Reduce fuel with roller chopping or mowing to facilitate burning in areas with high fuel loads.

Table 9: Burn Zones for Fire-Dependent Natural Communities of the Crystal River Preserve State Park

Burn Zone	Description	Acres	Intended Fire Frequency	Next Intended Burn
S1	Sandhill. Thick, primarily even-aged longleaf pine with encroaching oaks.	94	1-5	2004/2005
S2	Overgrown sandhill/scrubby flatwoods.	51	1-5	2004/2005
S3	Overgrown sandhill/scrubby flatwoods.	26	1-5	2004/2005
S4	Overgrown sandhill/scrubby flatwoods.	26	1-5	2004/2005
S5	Sandhill. Very few longleaf, overgrown with turkey oaks. Scrub on margins. Adjacent to large expanse of saltmarsh.	27	1-5	2004/2005
FI1	Scrubby flatwoods. Scattered longleaf with thick palmetto, lyonia, and scrub oaks.	221	2-8	2003/2004
FI2	Heavily disturbed. Scattered pockets of overgrown mesic and scrubby flatwoods.	127	2-8	2004/2005
H15E	Pockets of longleaf, some off-site slash pine. Remnant wiregrass. Significant outcroppings of limestone.	22	2-5	2004/2005
H15W	Pockets of longleaf, some off-site slash pine. Remnant wiregrass. Significant outcroppings of limestone.	45	2-5	2004/2005
H16	Off-site slash was harvested in 2000. Upland mixed and mesic flatwoods.	82	2-5	2003/2004
H17	Dense, rowed off-site slash pines with significant native understory.	40	2-5	2004/2005
H20	Primarily mesic flatwoods with longleaf.	62	2-5	2003/2004
H21	Pockets of longleaf with an east-west drainage in the center.	57	2-5	2003/2004
H22	Dense off-site slash pine with pockets of longleaf. Very little understory other than some saw palmetto and small cabbage palms. Burned in 2003.	44	2-5	2006/2007
H23	Dense off-site slash pine with pockets of longleaf. Very little understory other than some saw palmetto and small cabbage palms. Burned in 2003.	77	2-5	2006/2007
H24	Pockets of longleaf. Timber partially harvested in 2001.	78	2-5	2006/2007
H25	Primarily mesic flatwoods with longleaf.	22	2-5	2003/2004
H26	Rowed off-site slash pine. Burned in 2003.	9	2-5	2006/2007
H27	Heavily overgrown rowed off-site slash pine. Significant ladder fuels and dense understory.	70	2-5	2005/2006
H28	Off-site slash pine. Apparently recovering from a clearcut prior to state management.	18	2-5	2005/2006
H28a	Heavily overgrown rowed off-site slash pine. Significant ladder fuels and dense understory.	22	2-5	2005/2006

H29	Off-site slash pine in a mixture of upland mixed, mesic flatwoods, and hydric hammock.. Some loblolly pine.	80	2-5	2005/2006
H30	Off-site slash pine in a mixture of upland mixed, mesic flatwoods, and hydric hammock.. Some loblolly pine.	17	2-5	2006/2007
H31	Off-site slash pine in a mixture of upland mixed, mesic flatwoods, and hydric hammock.. Some loblolly pine.	17	2-5	2005/2006
H32	Hydric hammock with off-site slash pines on the edges.	76	2-5	2006/2007
H33	Off-site slash pine with a thick understory of saw palmetto and cabbage palm.	80	2-5	2004/2005
H33E	Wetlands with some upland mixed and mesic flatwoods.	15	2-5	2004
H34	Rowed off-site slash pines with significant native understory and groundcover.	27	2-5	2003/2004
H35	Off-site slash pine fringing a sawgrass marsh.	26	2-5	2004/2005
H36	Rowed off-site slash pine planted in marsh hammocks.	47	2-5	2004/2005
H64	Primarily hydric hammock with several large loblolly pines.	90	2-5	2006/2007
H66	Rowed off-site slash pine with native groundcover and understory on the west side and disturbed, overgrown off-site slash pine on the east.	102	2-5	2004/2005
H67	Off-site slash was harvested in 2000. Upland mixed and mesic flatwoods.	60	2-5	2003/2004
H69	Pockets of off-site slash in hydric hammock.	52	2-5	2005/2006
H69S	Hydric hammock with loblolly pines and some off-site slash pines.	21	2-5	2005/2006
H70	Narrow strip of mesic flatwoods bordering quarry pits.	53	2-5	
H71E	Bahiagrass pasture with wax myrtle, scattered pine trees, dog fennel, broomsedge, and cordgrass. Excellent birding with very productive bluebird nesting boxes.	91	Annually	2004
H71W	Bahiagrass pasture with wax myrtle, scattered pine trees, dogfennel, broomsedge, and cordgrass. Excellent birding with very productive bluebird nesting boxes.	144	Annually	2004
H72NE	Sandhill. Timber was harvested in 2001. Some wiregrass and turkey oak remaining.	29	1-5	2003/2004
H74E	Mesic/Scrubby flatwoods. Several large longleaf pines, some wiregrass, and sandhill-like “oak domes” with an understory of saw palmetto.	14	2-5	2003/2004
H74W	Off-site slash in upland mixed and hydric hammock.	8	2-5	2003/2004
H75	Primarily wetland with rowed off-site slash pines on the southwestern edge. Dense, overgrown understory.	279	2-5	2004/2005
Scrub 1	Oak/Lyonia scrub with saw palmetto. Roller-chopped in 2001 and burned in 2002.	33	2-5 initially, then 8-12	2003/2004
Scrub 2	Oak/Lyonia scrub and scrubby flatwoods. 25 year rough.	86	2-5 initially, then 8-12	2003/2004
Scrub 3	Oak/Lyonia scrub and scrubby flatwoods. 25 year rough.	116	2-5 initially, then 8-12	2003/2004
Scrub 4	Oak/Lyonia scrub and scrubby flatwoods. 25 year rough.	45	2-5 initially, then 8-12	2003/2004
Scrub 5	Oak/Lyonia scrub and scrubby flatwoods. 25 year rough.	47	2-5 initially, then 8-12	2003/2004
Scrub 6	Oak/Lyonia scrub and scrubby flatwoods. 25 year rough.	73	2-5 initially, then 8-12	2003/2004
BS1	Narrow corridors of mesic and scrubby flatwoods adjacent to hydric hammock, saltmarsh, and sawgrass marsh.	155	2-5	2003/2004
BS2	Hydric hammock with a fringe of off-site slash pine.	93	2-5	2003/2004
BS3	Primarily hydric hammock with scattered pockets of pine.	27	2-5	2003/2004

Archaeological, Cultural, and Historical Resources Management

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The preserve has a particularly difficult task in managing cultural resources in an expansive and dynamic coastal environment. To meet our cultural resource management goals the Crystal River Preserve State Park continuously seeks the advice of historical and archaeological experts in this effort. The Gulf Archaeology Research Institute (GARI) is a strong partner with the preserve. GARI has a staff with professional archaeologists with expertise in the cultural history of Citrus County. The preserve has proactively integrated cultural resource management to the model degree. When any proposed project may encounter potential cultural resources, GARI will conduct an investigation and cultural resources surveys well in advance of development to ensure that the project complies with Department of State (DOS), Division of Historical Resources (DHR) Bureau of Archaeological Research (BAR) policies and rules. Such studies have also been completed in areas recently subject to looting and vandalism to provide for better monitoring and law enforcement activity. The preserve seeks approval from DOS, DHR, and BAR before taking any actions, such as development or site improvements, that could affect or disturb the cultural resources on managed lands. A statement of DHR's policies and procedures for the management and protection of cultural resources is contained in Appendix 14.

Actions that require permits or approval from DHR include development, site excavations or surveys, disturbances of sites or structures, disturbances of the substrate, and any other actions that may affect the integrity of the cultural resources. These actions could damage cultural resources. In addition, the preserve has undertaken DHR/BAR approved site restoration activities, with the assistance of GARI (noted below) to insure the long-term protection of both vandalized and naturally disturbed archaeological sites. The preserve believes it has fully integrated cultural resources protection into its resource management practices which permit staff to intuitively consider potential affects across the realm of their respective management responsibilities and provide for the necessary protection.

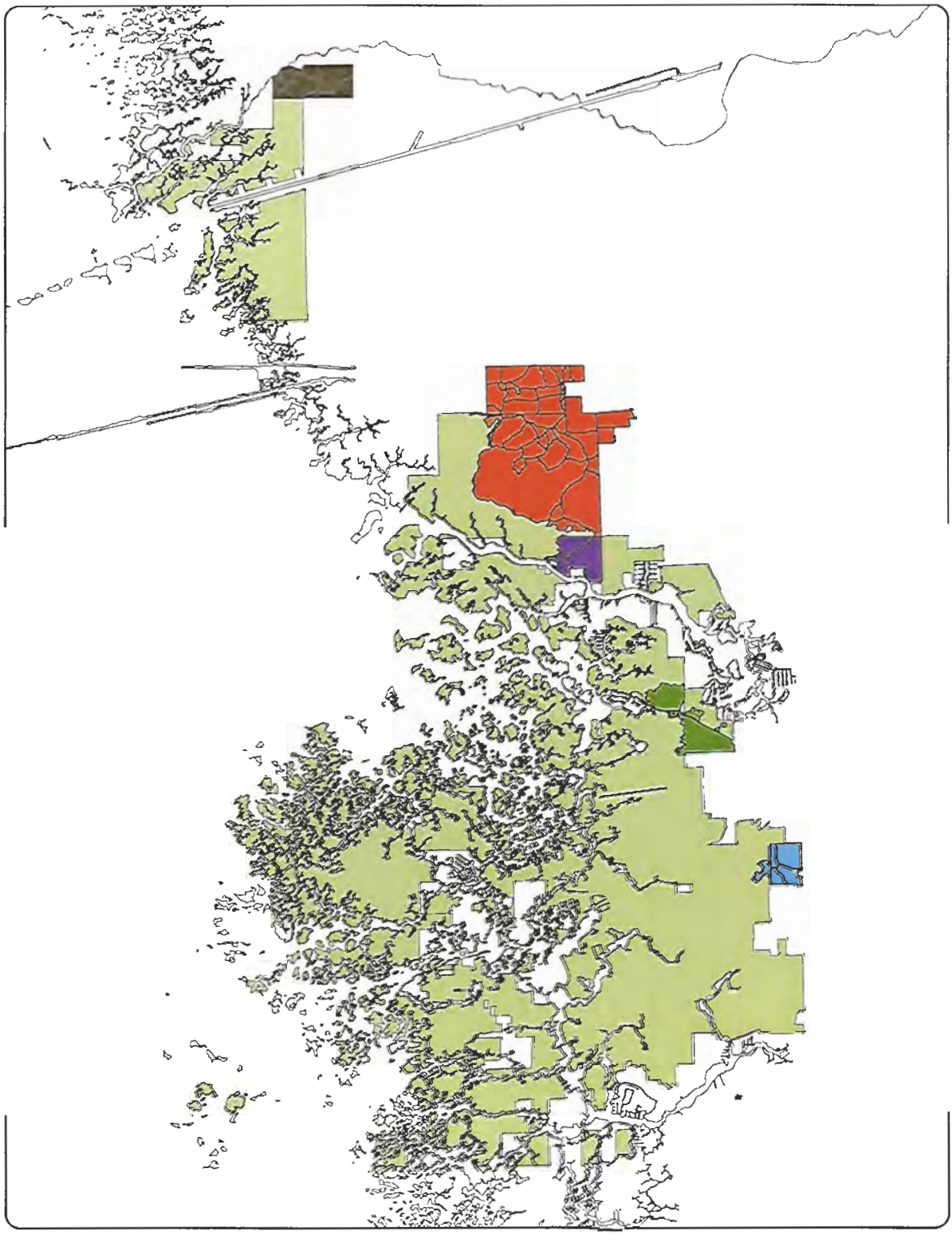
Many of the archaeological sites within the preserve are remote and only accessible by boat over much of the year. Public lands, by definition, allow (compatible) public use of these areas. This situation poses logistical problems for monitoring and early detection of unauthorized activities. Frequent aerial monitoring, boat, and foot patrols have proven to be the most expedient and effective method of protecting most of these sites, and patrols are conducted by preserve staff, volunteers, and the DEP Division of Law Enforcement personnel. Vigilance in these activities have allowed for the early detection of significant site disturbing effects by vandals, resulting in law enforcement action and the subsequent restoration of affected sites.

Cultural resources inventories are being conducted in cooperation with GARI and DHR in accordance with the guidelines established by DHR and coordinated with the Bureau of Archaeological Research as needed (Appendix 10). Gulf Archaeology Research Institute has provided multi-year service in expanding the preserve site inventory and assisting in integrating non-cultural resources and cultural resources management practices. All of these activities are coordinated with and permitted by the DOS/BAR to insure continuity of professional practice and flow of information on inventory and protection. The preserve has a strong record in site location, identification, protection, and restoration. The monitoring of known sites is an ongoing responsibility of the preserve management.

In coordination with DHR/BAR, the Crystal River Preserve State Park will survey for archaeological and historic sites on the preserve, with the assistance of GARI, and ensure they are recorded in the Master Site File. The preserve recognizes the difficulty in conducting single event surveys to locate and identify the sum total of cultural resources located within its managed lands. Citrus County has a dynamic coast and subject to naturally obfuscating conditions. We do recognize that the conduct of carefully planned archaeological surveys that build on previously recorded information and better-defined natural-physical contexts offer the best, efficacious route to site location and identification. The approach is cost-effective as it allows staff to contribute its growing body of information on coastal processes with that continuously compiled by archaeologists to generate short-term, but effective survey studies. The sites are out there and the current strategy of cooperative, multi-disciplinary projects has been most effective.

The Crystal River Preserve State Park anticipates conducting future surveys across several key tracts with the assistance of GARI: The islands within the estuary (between the Salt River and the Gulf north of Ozello), the estuarine boundary along the north bank of the Crystal River, the south Withlacoochee River Tract (estuarine and upland terrestrial tract between Florida Power and the Withlacoochee River), the coastal lowland and plain upland

Map #16: Fire Management Zones of the Crystal River Preserve State Park



Crystal River Preserve State Park

Fire Management Zones

- BS (Bumup & Sims)
- FI (Fort Island)
- H (Hollins)
- S (Sterchi)
- Scrub

1 0.5 0 1 Miles

terrestrial tracts within the preserve, and the Church House Hammock tract from U.S. 9 to the north bank of the Crystal River. Other survey projects necessary in the coming years will be the inner islands and saltmarsh of the lower Salt River between Ozello and the Homosassa River. This survey would be sub-divided into three phases. Phase 1 would continue the island survey south of Ozello. Phase 2 would survey the estuarine islands and karst features east of the Salt River. Phase 3 would survey the estuarine islands and karst features west of the Salt River. Up to the present day, archaeological survey within all of the areas noted above have been confined to overviews with a reconnaissance component (Willey 1949; Bullen 1951, 1953, 1966a, 1966b, 1966c; Miller 1973; Dorian 1980; Weisman 1987, 1990, 1993; Denson& Ellis 1992; Ellis, Dorsey & Denson 1993 and 1995; Ellis & Denson 1998; Ellis, et al 2001; and Ellis, Dean & Bennett 2001). Between 1998 and 2001 the archaeological studies focused on assessments tied to land acquisition and management needs, such as, canoe trails, recreation areas, or site restorations. Few large area comprehensive archaeological surveys have been conducted to date along the coastal strand. However, previous studies have all contributed to the recognition that the prehistoric occupation of the region is more extensive than that currently recorded and, thus, the need for further, multi-disciplinary studies. In addition, the dynamic nature of the coast has required archaeological inquiry to become more sophisticated with respect to the understanding of natural and physical processes over a long period of time. The recovery of archaeological data from past human occupation of the coastal strand includes historical natural and physical data which bears on current land management issues with respect to the range of affects on ecology and their recovery, preservation, and restoration. In this regard, the Crystal River Preserve State Park has historically viewed cultural resources investigations across its managed lands as a contributory function rather than just a location, identification and protection requirement. Cultural resources studies have multi-disciplinary application. Coincident with the terrestrial, island, and karst land studies should be the consideration of underwater survey. The Crystal River Preserve State Park is increasingly aware that submerged cultural resources exist within its managed lands. Some of these resources are subject to looting and vandalism. We can better protect those resources when they are brought into the inventory and the preserve anticipates expanding its multi-disciplinary site survey program to meet that need.

Goal 9: Survey, monitor and protect archaeological and historic sites on the preserve

Objective 9a: In coordination with DHR and GARI, survey for archaeological and historic sites on the preserve and ensure they are recorded in the Master Site File.

Objective 9b: Patrol archaeological and historic sites on the preserve to prevent damage.

Objective 9c: Conduct all ground-disturbing activities in accordance with DHR guidelines.

Objective 9d: Regularly assess the condition of archaeological and historic resources. Monitor the condition of sites in poor condition.

Scenic Resources Management

There are many areas within the preserve that can be considered scenic resources. Among these are the trails that are part of the west section of the Great Florida Birding Trail and the vistas provided over marshes and open water. The preserve will work to maintain the scenic quality of these areas.

Goal 10: Protect the scenic resources of the preserve

Objective 10a: Identify the scenic resources of the preserve and potential threats to those resources.

Objective 10b: Ensure that preserve operations do not decrease the scenic qualities of the preserve, unless necessary to protect the natural resources and visitor safety.

Security Management

The preserve field office located in Crystal River is protected by electronic security alarms and by gated entrances. The Citrus County Sheriff's Office has a Marine Unit office located at the preserve. The Citrus County Sheriff's Office and the Crystal River Police Department regularly patrols the entrances. The Crystal River Police Department responds to all alarm activation events. The DEP Division of Law Enforcement (Florida Park Patrol) also is actively involved in patrol of the preserve. FWC also regularly patrols the preserve.

Goal 11: Establish security measures sufficient to protect the preserve's integrity and to restrict unauthorized access and use

Objective 11a: Post and maintain the boundary of the preserve.

Objective 11b: Fence the preserve boundary where necessary to prevent illegal use.

Research and Monitoring

Any research or other activity that involves the collection of plant or animal species on state preserve property requires coordination with the preserve manager. Permits from the Florida Fish and Wildlife Conservation Commission, the Department of Agriculture and Consumer Services, or the U.S. Fish and Wildlife Service may be required.

Most research and monitoring efforts on the preserve began in early 1995. Prior to that the FWC (then GFC) had conducted some herptile monitoring on the Williams tract in the early 1990's. From 1995 to 1997 most activities were monitoring programs designed to create a species inventory and detect listed species in representative habitats of the preserve. Since 1997 monitoring projects have been designed to influence or determine the effects of resource management activities like prescribed fire and selective timber harvest. Research projects have been limited and preserve staff served to facilitate the researchers. The following describes monitoring and research projects that have been initiated on the Crystal River Preserve State Park.

Research

Fire and cabbage palm mortality

This work was done by a graduate student from the University of Florida as part of her master's degree. Staff assisted the student in determining the mortality rates for different year classes of cabbage palms that were exposed to fire. Large numbers of these trees were marked, and heat sensitive plates were placed at their bases. Then a prescribed fire was performed and results were documented. It was determined that, in general, cabbage palms suffer about 4% mortality when exposed to fire. The most susceptible age class was the younger plants that had just pushed their apicle meristem above the soils surface.

Oxygen production in needle rush

Along with a student, a professor from the University of Florida performed a manipulative experiment on black needle rush. Vials were placed over the tips of the plants to measure oxygen production. Next the plant stems were cut to a prescribed height and the experiment was repeated. In another experiment oxygen production was determined both before and after needle rush plants immediately adjacent to the experimental plot were removed.

Whooping crane reintroduction/sandhill cranes winter health

Since 1997, the Crystal River Preserve State Park has been a participant in the whooping crane reintroduction project, which is a multi-agency, multi-national endeavor. Staff worked directly with researchers from Texas A&M to determine the forage and prey items that are part of a whooping cranes normal diet. An ancillary part of this project was to assist a Ph.D. candidate with her research on the spatial arrangement of foraging wading birds. In the fall of 2000, a flock of sandhill cranes followed an ultralight aircraft from Wisconsin to the preserve to test the route for the whooping cranes that made the trip the following year. The sandhill cranes remained on the preserve in an enclosure from November to late February when they began to migrate back to Wisconsin. During their stay on the preserve they were monitored for health and behavior, which was part of a larger research project. Staff assisted personnel from the USFWS and the International Crane Foundation and the University of Florida with this research project.

Black bear research

A young black bear that was struck by a car was radio-collared and released on the preserve. Researchers from the University of Kentucky and FWCC tracked the animal's movements on the preserve and surrounding lands. Researchers were housed in the preserve's visiting scientist dorms. Other bear researchers have stayed on the preserve over the years and attempted to document bears.

Future Research

Diamondback terrapins

Preserve staff in association with contracted researchers plan to study diamondback terrapins. Diamondback terrapins are inhabitants of coastal marshes and swamps from Cape Cod down the Atlantic coast, through Florida to

Texas. At the turn of the century their meat was considered a delicacy, which led to declines throughout their range. Blue crab traps also pose a threat to terrapins as they can become trapped and drown. This research will be conducted to determine terrapin populations, nesting areas, habitat quality, mortality causes, and human impacts along the Citrus County coast.

Eastern diamondback rattlesnakes
Preserve staff plan to study diamondback rattlesnakes. The eastern diamondback rattlesnake has suffered population declines due to loss of habitat and persecution from humans. Despite the fact that diamondback rattlesnakes are not a federal or state listed species, they may at risk to local extinctions. This research will be conducted to determine rattlesnake populations, nesting areas, habitat quality, mortality causes, and use of gopher tortoise burrows for refugia.

Frog population monitoring
Worldwide populations of frogs appear to be in serious jeopardy. This research and monitoring will focus on frog call surveys and frog trapping to determine frog populations, abundance, and species structure on the preserve. The frog call surveys will be conducted once per month in conjunction with volunteers to determine relative abundance, calling intensity, and species present. Frog trapping will consist of drift fences or bucket traps installed around various wetlands on the preserve. The drift fences will be constructed in such a way as to determine whether frogs are entering or leaving wetlands. Toe clipping will be used to identify individuals for population estimates.

Panoramic photopoints
This project will entail placing set points on the preserve for photographic documentation. A camera will be placed at the photopoint and pictures will be taken in the cardinal directions (north, south, east, west). The pictures will then be entered into a computer program which will "stitch" the pictures together for a three dimensional view of the area. The photopoints will be taken quarterly to document vegetation responses to restoration and prescribed fire.

Gopher tortoise burrow occupancy rates,
Gopher tortoises utilize burrows for refugia that are easily discernable by the trained observer. Since several gopher tortoises may use a single burrow and they may abandon their burrows, counting burrows alone is not a reliable index of tortoise populations. Utilizing methods described by Ashton and Ashton (2001), preserve staff will survey gopher tortoise burrows to determine activity levels, relative populations, and age classes. The preserve also has a burrow scope with an infra-red camera that will also be used to assist in determining occupancy rates.

Fire effects monitoring
This project will look at fire intensity, fire intensity, duff depth, and duff reduction. This will be done through the use of panoramic photopoints, fire intensity sensitive paints, and duff pegs. Determining how conditions on a given prescribed fire can affect intensity and severity will help preserve staff to tailor prescriptions to meet specific management goals and mimic natural fire regimes more closely.

Monitoring

Small mammal monitoring
In order to evaluate the diversity and population size of small mammal species on the preserve a mark/recapture monitoring program was begun in the fall of 1995. Four different habitats were selected for sampling; pine flatwoods, sandhill, hydric hammock and saltmarsh. Within each habitat type, 100 live traps are situated in a 10x10 grid with traps spaced every ten meters. Cotton mice and cotton rats have been captured in large numbers in the uplands habitats, while cotton mice and wood rats typify the hydric hammock and cotton rats and rice rats occupy the saltmarsh. Golden mice, short-tailed shrews and long-nosed shrews have also been collected, as are occasional gray squirrels and cottontail rabbits. Individuals are fitted with an ear tag and the rate of recaptures to new captures is used to estimate population size. Most specimens appear to be in good physical condition with the occasional tick or botfly larvae. After the first two years of monitoring the program was reduced to twice-annual sampling and now is done once a year. In the habitat that had a selective timber harvest (sandhill), the population of cotton mice has increased dramatically. This is likely a response to more herbaceous ground cover, which provides more shelter and food.

Point count survey

Late in 1995 a point count monitoring program for birds was initialized. As with many other monitoring programs the intent was to determine the diversity and abundance of bird species within the preserve and to have a tool to gauge the effects of prescribed fire and selective timber harvests. Because most restoration activities are scheduled for upland habitats, the point count survey focuses on forested uplands which include sandhill, pine flatwoods, hardwood hammock and plantation communities. The count has been done quarterly since the fall of 1995. Resultant data indicate that the times of highest bird diversity and abundance are in the spring and fall during the migration. Species compositions in areas that have been timbered have changed somewhat. There remains a large amount of analysis to be done comparing patterns among community types and looking at changes that result from land management practices. This project has created one of the longest, most complete data sets used by the preserve.

Herptile monitoring

Beginning in 1998 three separate herptile arrays were deployed on the Crystal River Preserve State Park. Again, the purpose of the monitoring effort was to quantify the diversity and abundance of reptiles and amphibians within the preserve and note changes in these metrics relative to land management activities. Each array consists of three drift fences that empty into four pitfall buckets and each fence has two funnel traps associated with it. These arrays have been successful in catching toads, small snakes, skinks and lizards. Late in 2002 salamander traps were introduced at scattered wetlands. All captures are released unmolested and the information from each individual is added to the database. Because many reptiles and amphibians are not readily observed, this continuing monitoring effort has been very beneficial to the knowledge base of the preserve.

Restoration monitoring

With selective timber harvests as one means for restoring pine plantations to their original flatwoods community type, preserve staff felt it was important to measure the success of this practice. In other words, did the timber harvest restore the appearance of the community or did it also restore the constituent floral and faunal components as well? To this end a large-scale restoration monitoring program was developed to monitor the pre- and post harvest ecological conditions and changes in the systems as natural processes took over and the habitat moved toward or away from the ideal of a restored flatwoods community. There are several parts to this monitoring program, which evaluates plant and animal communities within the restoration area.

Animal communities are monitored along 300m transects. Each transect has 30 Sherman live traps at regular intervals, herptile arrays in the center and locations to conduct bird count points in the center. With this monitoring arrangement most animal communities in the restoration area are evaluated.

A wide variety of methodologies are applied to assess the changes in and composition of plant communities within the restoration site. Point-centered quarters provide a means to quantify the diversity, density and growth of woody vegetation. Biomass transects collect information on the diversity, dominance and growth patterns of herbaceous vegetation. Canopy cover estimates speak to the available light for shrubs and ground cover and can be related directly to biomass data. Each of these are located on a 100m cross transects on the 300m central transect. Species-area curves give managers a look at changes in diversity over time and are useful in determining community stability as well as overall diversity on the entire floral community. Photo points are located at the center of each 300m transect to document changes after land management applications.

Monitoring prior to the selective timber harvest yielded baseline data about the conditions prior to restoration activities. Monitoring since then has revealed how the system is recovering and whether or not the restoration activities are having the desired effects. For nearly three years restoration monitoring was done quarterly. Currently some components are conducted annually, semiannually and quarterly. In general, animal and plant species have increased in diversity and density and the community is restoring itself towards a functioning pine flatwoods ecosystem.

Goal 12: Facilitate and conduct scientific research and monitoring to optimally manage and protect natural communities and native plant and animal species of the preserve

Objective 12a: Monitor photo-plots in natural communities on a quarterly basis.

Objective 12b: Annually sample vegetative treatment plots.

Objective 12c: Sample small mammal and herptiles to evaluate community response to restoration on a quarterly basis.
Objective 12d: Ensure that all research and monitoring projects have all required permits from relevant agencies.

Education and Training

Education and public outreach focuses on the preserve, the estuary, natural resources, and the issues and problems associated with them. Education and public outreach programs are comprised of on and off-site speaker/slide/PowerPoint/ and video presentations, interpretive field trips, workshops, youth programs, exhibits, and traveling displays. DEP publications and educational materials are distributed through this office on request to individuals and to other government agencies, nature centers, and organizations, which further disseminate the information to target audiences and the general public.

Training of staff is accomplished through the use of interdepartmental, intergovernmental, public, and private educational institutions. Specialized training in the areas of special use vehicles, equipment operation, boating, fire management, geographic information systems, data collection and management are scheduled for applicable staff and generally carried out as part of the overall training plan. Fire training offered by the Florida Division of Forestry such as inter-agency prescribed fire, fire behavior, engine academy, etc., will continued to be offered to preserve staff. Staff are also encouraged to take part in training offered by the by the Natural Areas Training Academy. Additional training needs are identified and appropriate funding sought as part of the annual budget planning process.

Employee health and safety are of prime concern, and each employee is encouraged to exercise caution in the performance of all daily tasks. Ongoing safety awareness training is conducted at the preserve during staff meetings. Office, Division, and Department, as well as other agency safety training (i.e. CPR and First Aid) and health advisory sessions are established as needed.

Local outreach efforts are typically tailored to serve a specific event, specific target audience, or resource user group. Preserve staff coordinate and present a number of programs and events each year. However, the requests and need for programs far exceed the staff available. Efforts to fill the gap between supply and demand include: recruitment and training of volunteers, partnerships with other organizations, and fostering a Citizen Support Organization (CSO) to facilitate expansion of activities, increase public awareness of preserve programs and goals, and develop stewardship of the preserve.

A monthly educational movie night is offered free to the public, our “Redfish Revue”. Outreach staff will also conduct several educational courses for the general public and children including Master Naturalist, Newcomers to Florida, Environmental Scene Investigators (ESI), and ESI Junior. Staff also will continue to participate in outreach events such as the Springs Festival, the Birding Festival, Save our Waters Week, Citrus County Days, and other opportunities as they arise. Between Redfish Revue, classes, and outreach events, staff plans to participate in upwards of 30 events per year.

Goal 13: Educate the public and local governments concerning resources, issues and management goals/objectives of the preserve

Objective 13a: Interact with adjacent landowners via phone, mail, and direct contact regarding management issues, such as exotics and burns.
Objective 13b: Develop educational materials and displays, including entrance kiosk with regulations.
Objective 13c: Provide public service announcements to local and state media contacts on an as needed basis.
Objective 13d: Participate in upwards of 30 outreach events per year.

Public Access and Visitor Use

Public Access / Parking / Handicap Facilities

As discussed previously in this plan, the Crystal River Preserve State Park has established multiple public access areas (Map #12) and receives high levels of public use and a high level of recognition and support from the community. At several locations (the visitor center and the Eco Walk) there are sign-in books and suggestion boxes. Sign-in books and suggestion boxes will be installed at Churchhouse Hammock and the Loop Trail. In addition to

these passive tracking efforts, trail counters will be installed at the Eco Walk, Churchhouse Hammock, the Loop Trail, and the Redfish Hole.

Contingent upon funding, there are plans to install a canoe launch at the office/visitor center. Consideration will also be given to providing canoe/kayak access at the Mullet Hole. Other planned projects include the construction of a short boardwalk over saltmarsh and a loop trail extension around a hammock on the Dixie Shores Trail and a boardwalk extension of the Churchhouse Hammock Trails toward the Crystal River.

Goal 14: Provide public access to encourage compatible recreation uses where appropriate on the preserve that do not detract from the conservation and management goals and objectives

Objective 14a: As new facilities are developed, provide universal access in all cases except where the law allows reasonable exceptions.

Objective 14b: Establish up to two canoe launches in the vicinity of the visitor center.

Objective 14c: Establish a boardwalk across a section of saltmarsh and add a one-mile loop to the Dixie Shores Trail.

Objective 14d: Establish trail counters at Eco Walk, Churchhouse Hammock, the Loop Trail, and the Redfish Hole.

Objective 14e: Establish a boardwalk to extend the Churchouse Hammock Trail towards the Crystal River.

Education Facilities

At the main office of the Crystal River Preserve State Park, there is a visitor center with free educational materials and interpretive displays. At the visitor center, there is also an auditorium where free monthly educational movie nights are conducted for the public, our "Redfish Revue Theatre". This auditorium is also offered to the public free of charge for meetings (Citrus County Native Plant Society), classes, (Coast Guard Auxiliary Safe Boating Course) and other public events. At many trailheads, (Mullet Hole, Loop Trail, Redfish Hole, Eco Walk), educational kiosks are located with free educational brochures.

Goal 15: Establish locations for providing educational materials and/or programs for visitors

Objective 15a: Update visitor center educational displays.

Equestrian

In cooperation with the DEP Office of Greenways and Trails, an equestrian trail is planned for FY 04/05. This trail will access the Hollins North parcel and traverse a variety of habitats including pine flatwoods and hydric hammock (Map 13) and be connected to the existing equestrian trail at the Cross Florida Greenway. Much of these habitats are already disturbed and equestrian use is not likely to result in significant impacts. The trailhead and parking facilities will be located at the Cross Florida Greenway.

Goal 16: Encourage equestrian trails and facilities where appropriate on the preserve that do not detract from the conservation and management goals and objectives

Objective 16a: Establish an equestrian trail on the preserve in association with the Cross Florida Greenway.

Hiking / Biking

The preserve currently has 15 miles of hiking trails and 10+ miles of biking trails (Map #12). Trailhead facilities in the form of composting toilets are located at Churchhouse Hammock and the Mullet Hole with interpretative kiosks located along the trails. The preserve plans to establish additional trailhead facilities at the Redfish Hole, the Loop Trail, and Dixie Shores with interpretative kiosks located along the trails.

Goal 17: Encourage hiking/biking where appropriate on the preserve that does not detract from the conservation and management goals and objectives

Objective 17a: Maintain 25 miles of hiking/biking trails on the preserve.

Objective 17b: Establish trailhead facilities for hikers/bikers on the preserve at the Redfish Hole, the Loop Trail, and Dixie Shores.

Camping

The Crystal River Preserve State Park maintains a primitive youth camping area. The provision of additional primitive camping opportunities for individuals will be considered during the current management plan cycle. Decisions regarding the siting of additional camping sites will give primary consideration to potential impacts to natural and cultural resources.

Goal 18: Allow camping where appropriate on the preserve that does not detract from the conservation and management goals and objectives

Objective 18a: Maintain one primitive camping area on the preserve for local youth groups.

Objective 18b: Consider providing additional primitive camping opportunities for individuals.

Fishing

As described in previous sections of this plan, many areas of the preserve are available for fishing by the public. The preserve plans to maintain fishing areas and provide free educational materials such as FWC's "Fishing Lines" and monofilament disposal bins.

Goal 19: Encourage fishing where appropriate on the preserve that does not detract from the conservation and management goals and objectives

Objective 19a: Maintain fishing access points on the preserve at the Mullet Hole and the Redfish Hole.

Operations and Facilities

Cost Estimates and Funding Sources for Conducting Management Activities

The Estimated Annual Land Management Budget (Table 10) shows the activities planned for the next ten years and the annual cost estimate of each activity. Funds needed to protect and manage the property, and to achieve the objectives for the preserve, are derived primarily from the CARL Trust Fund. Private conservation organizations may be cooperators for funding of specific projects. Alternative funding sources, such as mitigation funds, will be sought to supplement existing funding.

The following represents the actual and unmet budgetary needs for managing the lands and resources of the Crystal River Preserve State Park. This budget was developed using data from CAMA 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 exceeds the funds the preserve has been receiving through the state appropriations process, but is consistent with the direction necessary to achieve the goals and objectives for the Crystal River Preserve State Park (see Appendix 13). Budget categories are those currently recognized by DEP and the Land Management Uniform Cost Accounting Council.

Table 10: Estimated Annual Land Management Budget for the Crystal River Preserve State Park (Amount in thousands of dollars; includes staff time)										
Activity	**2004**	**'05**	**'06**	**'07**	**'08**	**'09**	**'10**	**'11**	**'12**	**'13**
Resource Management										
Exotic species control	120	15	15	15	15	15	15	15	15	15
Prescribed burning (including roller chopping)	40	41	41	42	42	43	43	44	44	45
Cultural resource management	10	10	10	10	10	10	10	10	10	10
Timber management	10	10	10	10	10	10	10	10	10	10
Hydrological management	15	15	15	15	150	15	15	15	15	15
Other (inventory, mapping, monitoring, exotic animal control)	30	30	31	31	32	32	33	33	34	34
Subtotal	**225**	**121**	**122**	**123**	**259**	**125**	**126**	**127**	**128**	**129**
Administration										
Units/Projects	60	60	61	61	62	62	63	63	64	64
Subtotal	**60**	**60**	**61**	**61**	**62**	**62**	**63**	**63**	**64**	**64**
Support										
Land management planning	20	20	21	21	22	22	23	23	24	24
Land management reviews	0	0	0	3	0	0	0	0	0	0
Training/staff development	4	4	4	4	4	4	4	4	4	4
Vehicle purchase	0	120	0	0	0	20	0	0	20	120
Vehicle operation and maintenance	10	5	5	6	7	5	5	7	6	5
Other	10	10	10	10	10	10	10	10	10	10
Subtotal	**44**	**159**	**40**	**44**	**43**	**61**	**42**	**44**	**64**	**163**
Capital Outlay										
New facility construction (incl. fencing)	8	30	30	30	0	0	0	0	0	0
Facility maintenance	25	25	25	25	25	25	25	25	25	25
Subtotal	**33**	**55**	**55**	**55**	**25**	**25**	**25**	**25**	**25**	**25**
Visitors services/Recreation										
Information/Education programs	55	55	56	56	57	57	58	58	59	59
Operations	10	10	11	11	12	12	13	13	14	14
Subtotal	**65**	**65**	**67**	**67**	**69**	**69**	**71**	**71**	**73**	**73**
Total	**427**	**460**	**345**	**350**	**458**	**342**	**327**	**330**	**354**	**454**

Planned new facilities include up to two canoe/kayak launches, boardwalks for the Dixie Shores Trail and Churchhouse Hammock Trail, composting toilets for trailheads at the Loop Trail, Redfish Hole and Dixie Shores Trail and additional office space with employee restrooms at the main office.

Table 11 shows the current staffing level for Crystal River Preserve State Park. "FTE" refers to full-time equivalent permanent staff members. "OPS" refers to other personnel services, which are temporary staffing positions. The number of FTEs or OPS refers to the number of full-time permanent or temporary staff members in each position title. The preserve is administered by the same management staff responsible for Crystal River Archaeological State Park and the Yulee Sugar Mill Ruins Historic State Park.

Table 11: Current Staffing Level for Crystal River Preserve State Park		
Position Title	**# FTEs**	**# OPS**
Park Manager II	1	
Environmental Specialist II	1	
Environmental Specialist I		1
Park Services Specialist	2	
Volunteer Coordinator		1
Park Naturalist		2
Administrative Assistant I	1	
Maintenance Mechanic	1	
Laborer		2
Total	6	6

Goal 20: Conduct operations and obtain and maintain facilities and staff to soundly manage, protect and make accessible the preserve

Objective 20a: Pursue adequate levels of funding to support preserve operations including monitoring and fire management.

Objective 20b: Pursue alternative funding sources, such as mitigation projects, grants and fundraising, to supplement existing funds.

Objective 20c: Provide additional office space and restrooms within the existing visitor center/office complex.

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

The following restoration and management activities have been considered for outsourcing to private entities. In general, most day-to-day operations of the preserve can be handled more efficiently and at a lesser cost with DEP staff. Projects requiring excavation and engineering must be outsourced. In the past five years, outsourced labor has included exotic species management, lawn care, and janitorial services. Table 12 contains potentially outsourced activities with categories as follows: "approved" designates items that DEP does not have expertise to complete and/or those that can be done at less cost with equivalent results by outside sources; "conditional" designates items that can be done by DEP or outside sources for equivalent cost and results; "rejected" designates items that can be done better with DEP expertise and/or at less cost than outside sources.

Table 12: Potential Contracting for Activities on Crystal River Preserve State Park			
Activity	**Approved**	**Conditional**	**Rejected**
Prescribed burning		✓	
Minor fireline installation	✓		
Fireline, fence, and trail maintenance	✓		
Fence installation	✓		
Roller chopping	✓		
Organism inventory and monitoring		✓	
Listed species mapping and needs assessment		✓	
Restore/enhance encroachment and ruderal areas		✓	
Determine extent of hydrologic needs of the preserve		✓	
Restore hydrology via fill and excavation	✓		
Reduce exotic species	✓		
Education facilities, programs, and literature development and printing		✓	
Education signs development and installation		✓	
Trail and boardwalk installation	✓		
Law enforcement and patrol	✓		
Timber harvesting		✓	

Goal 21: Consider outsourcing those preserve operations that outside sources can conduct at less cost and with equivalent or better results than preserve staff

Objective 21a: On a continuing basis, analyze preserve operations and identify those activities for which preserve staff do not have the expertise or that can be completed at less cost with equivalent or better results by outside sources.

Partnerships and Regional Coordination

Cooperating Agencies

The Crystal River Preserve State Park coordinates land management, restoration, and education/outreach efforts with local, state, and federal agencies. The preserve is managed in accordance with all applicable Florida Statutes and administrative rules. Agencies having a major or direct role in the management of the preserve are discussed in relevant portions of this plan. The Department of Agriculture and Consumer Services, Division of Forestry (DOF), assists DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC) assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The DEP, Bureau of Beaches and Wetland Resources aids staff in planning and construction activities seaward of the Coastal Construction Line. Emphasis is placed on protection of existing resources as well as the promotion of compatible outdoor recreational uses.

Crystal River Preserve State Park property borders on the Chassahowitzka National Wildlife Refuge and the Cross Florida Greenway, which are managed by USFWS and DEP Office of Greenways and Trails, respectively, and the Crystal River Archaeological State Park and Homosassa Springs Wildlife State Park, which are also managed by DRP. The St. Martins Marsh and Big Bend Seagrasses Aquatic Preserves field office is located within Crystal River Preserve State Park, providing preserve and aquatic preserve staff the opportunity to interact regularly, and to coordinate management activities for the preserve and aquatic preserves. Aquatic preserve staff will provide technical expertise and support to preserve staff in the areas of aquatic plant management and exotics control, erosion control and storm water runoff management, and public outreach and education. Aquatic preserve staff will also participate in prescribed burning and other resource management activities on the preserve. This cultivates teamwork resulting in an ecosystem management approach that benefits our precious coastal resources. Similarly, DRP staff will provide support to the aquatic preserve management staff where appropriate.

The preserve will continue to seek new partnerships with government agencies.

Goal 22: Establish and maintain relationships with other agencies to enhance management and protection of the preserve

Objective 22a: Coordinate management efforts with other agencies including USFWS, SWFWMD, USGS, etc.

Objective 22b: Coordinate with local law enforcement and permitting agencies regarding patrol and potential violations include SWFWMD, DEP, FWC, Citrus County Sheriff's Office, Crystal River Police department, etc.

Objective 22c: Continue collaborative efforts with DOF, FWC, DHR, DEP and others for the protection and management of activities on the preserve.

Objective 22d: Encourage establishment of resource monitoring stations by WMD or other entities on the preserve.

Objective 22e: Coordinate joint educational programs with other state agencies and the local education community.

Cooperating agencies include:

- U.S. Fish & Wildlife Service
- United States Geological Survey
- U.S. Department of Agriculture
- National Oceanographic & Atmospheric Administration
- Americorps National Civilian Community Corps
- Florida Fish & Wildlife Conservation Commission
- Florida Division of Forestry
- Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas

- Florida Department of Environmental Protection, Bureau of Invasive Plant Management
- Florida Department of Environmental Protection, Southwest District
- Florida Natural Areas Inventory
- University of Florida
- State of Florida University System
- Southwest Florida Water Management District
- Citrus County
- City of Crystal River

Cooperating Organizations

The preserve seeks to establish a CSO organization in to provide volunteer and educational/outreach support for the preserve. The preserve also coordinates with nongovernmental organizations such as The Nature Conservancy and The Audubon Society. Currently volunteers maintain a garden at the visitor's center, which serves as a demonstration project for native landscaping and water conservation.

Goal 23: Establish and maintain relationships with other organizations to enhance management and protection of the preserve

Objective 23a: Establish Citizen Support Organization and solicit volunteers to assist preserve staff to accomplish goals of the preserve.

Objective 23b: Provide preserve and community recognition and support for volunteers.

Objective 23c: Generate 1,000 hours per quarter from volunteers per year to assist in preserve management and education.

Land Use Coordination

Staff are copied on applications for Developments of Regional Impacts (DRI's) in Citrus County by the regional planning councils and reviews those applications and makes appropriate comments. The preserve also coordinates and communicates with the City of Crystal River and Citrus County on potential new development and zoning issues. The preserve is also advised to changes with local comprehensive land use plans. The preserve also conducts joint prescribed burns with adjacent private and public landowners.

Goal 24: Review, define, and minimize impacts associated with planned and existing development along or within the preserve

Objective 24a: Continually review comprehensive plan amendments and land development regulations that govern proposed land use changes on properties adjacent to the preserve and coordinate with District and Division headquarters on comments.

Prospective Land Acquisitions and Potential Surplus Lands

Not all lands within the Florida Forever project boundaries for Crystal River Preserve State Park have been acquired. Some of the remaining acquisitions are more important than others. The lands of highest importance buffer the preserve from surrounding development/activities, possess high natural resource values, provide a more manageable property boundary, provide linkage to other state-owned lands or private conservation lands, provide public access, and are significant for fire management.

Through the use of an extensive GIS database, the preserve has identified an optimum boundary with potential acquisitions. The preserve has identified all properties within the current Florida Forever acquisition boundary and properties outside the boundary that are important to protect the resources for which the project was initiated. The preserve staff also assists acquisition agents with identifying, assessing, and prioritizing potential acquisitions. These properties are necessary to provide the optimum boundary for the preserve. As additional needs are identified through preserve use, development, and research, and as adjacent land uses continue to change on private properties, the optimum boundary for the preserve may be modified for the enhancement of natural and cultural resources, recreational values, and/or management efficiency.

Goal 25: Define optimum boundaries for the preserve and facilitate acquisition and/or surplusing of lands to achieve these boundaries

Objective 25a: Identify lands outside of the current project boundaries that are necessary for the perpetual protection of the preserve.

Objective 25b: Nominate for acquisition through Florida Forever all parcels that are important for management of the preserve or contain important resources.

Objective 25c: Identify lands within the current project boundaries that are not needed for resource protection, management or use of the preserve.

Objective 25d: Assist in the acquisition of all lands within the Florida Forever boundary parcels by providing DEP with information on development, available parcels, ownership, and local contacts every 6 months or as needed.

Compliance with State and Local Government Requirements

This land management plan is in compliance with the Citrus County and Crystal River Local Government Comprehensive Plan (Appendix 15). DRP will ensure that each planned use complies with the State Lands Management Plan adopted by the BOT, and particularly whether such uses represent "balanced public utilization", specific agency statutory authority, and other legislative or executive constraints. The plan is intended to be in compliance with the State Lands Management Plan, adopted March 17, 1981 by the Board of Trustees of the Internal Improvement Trust Fund.

Goal 26: Ensure that use and management of the preserve complies with state and local government requirements

Objective 26a: Ensure that each planned use of the preserve complies with the State Lands Management Plan adopted by the Trustees.

Objective 26b: Ensure that each planned use of the preserve complies with the Local Government Comprehensive Plan.

Land Management Review

Land management review teams were established by Section 259.036, Florida Statutes, to evaluate management of conservation, preservation, and recreation lands titled in the name of the Board of Trustees of the Internal Improvement Trust Fund. The teams determine whether the lands are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032 by the Board of Trustees, acting through the Department of Environmental Protection. The managing agency is to consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan.

A land management review team evaluated the Crystal River State Buffer Preserve on August 1, 2000. The review team made the following determinations:

1. The team recommends that FTE positions be established in lieu of current OPS positions for the buffer preserve.
2. The team recommends that pine plantation restoration sites be prioritized based upon site natural values in the updated management plan.

The following commendation's resulted from a discussion and vote of review team members.

1. The team commends CAMA staff for an exceptional job in sharing funding between the different units for resource management and environmental education.
2. The team commends the staff for their efforts and involvement in the local Eco Heritage Tourism Community.
3. The team commends preserve staff for their cooperation with other agencies, particularly Gulf Archeology Research Institute.
4. The team commends preserve staff for seeking supplemental funding through grants.

The land is being managed for the purpose for which it was acquired, and the actual management practices, including public access, were in compliance with the management plan for this site. The land management review team report, including CAMA's response to that report, is contained in Appendix 16.

Priority Management, Research, and Information Needs

- Pursue adequate levels of funding to support preserve operations including monitoring and fire management.
- Facilitate and conduct scientific research and monitoring to optimally manage and protect natural communities and native plant and animal species of the preserve
- Conduct fire management operations to help restore and maintain natural communities and to mimic natural fire effects
- Identify historic vegetative community types of the preserve by 2005 in order to restore habitats to the proper natural community composition.
- Survey, monitor and protect archaeological and historic sites on the preserve.
- Identify lands outside of the current project boundaries that are necessary for the perpetual protection of the preserve.
- Nominate for acquisition through Florida Forever all parcels that are important for management of the preserve or contain important resources.

V. Literature Cited

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Appendix 1

Trustees Lease Agreement

AOL1

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION,
OFFICE OF COASTAL AND AQUATIC MANAGED AREAS
ASSIGNMENT AND ASSUMPTION OF

Lease Numbers:

4085 Charlotte Harbor State Buffer Preserve
4140 Cockroach Bay State Buffer Preserve
4084 Crystal River State Buffer Preserve
4083 Estero Bay State Buffer Preserve
4305 Indian River Lagoon State Buffer Preserve
4178 North Fork St. Lucie River State Buffer Preserve
~~4074 Pumpkin Hill Creek State Buffer Preserve~~ (DUAL LEASE)
4118 St. Sebastian River State Buffer Preserve
~~4191 Terra Ceia State Buffer Preserve~~ (DUAL TRUSTEES & WMD LEASE NOT INCLUDED)
4306 Yellow River Marsh State Buffer Preserve

The State of Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas ("Assignor"), for value received does, subject to written consent of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida ("Lessor"), hereby assign, transfer and convey 100% of its rights, title, and interest vested under the above referenced leases ("Leases") made and entered into by and between Lessor and Assignor, as Lessee, to the State of Florida Department of Environmental Protection, Division of Recreation and Parks ("Assignee"), for and during the remainder of the term of the Leases and all renewals thereof, subject to the performance of all covenants, conditions, and provisions required to be performed by the Lessee under the terms of the Leases, and subject to the conditions and provisions therein set forth.

Dated December 5, 2003.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION, OFFICE
OF COASTAL AND AQUATIC MANAGED AREAS

Ellen L Stere
Witness
Ellen L Stere
Print/Type Witness Name

By: _____ (SEAL)
Katherine Andrews
Print/Type Name

Sherry G. Erwin
Witness
Sherry G. Erwin
Print/Type Witness Name

Title: CAMA Director

"Assignor"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 5th day of December, 2003 by Katherine Andrews, as Director, Office of Coastal and Aquatic Managed Areas, State of Florida Department of Environmental Protection. He/(she) is personally known to me.

Notary Public, State of Florida
Shannon Franklin
Print/Type Notary Name

Shannon Franklin
MY COMMISSION # DD119914 EXPIRES
May 23, 2006
BONDED THRU TROY FAIN INSURANCE, INC.

Commission Number: DD119914

Commission Expires: May 23, 06

ACCEPTANCE OF ASSIGNMENT AND ASSUMPTION OF LEASES

The State of Florida Department of Environmental Protection, Division of Recreation and Parks ("Assignee"), in consideration of the foregoing Assignment, subject to written consent of the Lessor, does hereby accept assignment of the Leases, and assumes and agrees for the benefit of the Lessor to perform all covenants, agreements, conditions and provisions of the Leases. Further, Assignee agrees that it, its successors and assigns shall be bound for the due performance herein in the same manner as was the Assignor, as the original Lessee named in the Leases, for and during the remainder of the term of the Leases and all renewals thereof.

Dated December 15, 2003.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION, DIVISION
OF RECREATION AND PARKS

Witness

Jerina Hughes
Print/Type Witness Name

Witness

Wilson Footman
Print/Type Witness Name

By: Albert G. Gregory (SEAL)
Albert G. Gregory

Title: Chief, Office of Park Planning

"Assignee"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 15th day of December, 2003, by Albert G. Gregory, Chief, Office of Park Planning, Division of Recreation and Parks, State of Florida Department of Environmental Protection. He is personally known to me.

Notary Public, State of Florida

Dale H. Quick
Print/Type Notary Name

Commission Number: DD122787

Commission Expires: June 20, 2006

Dale H. Quick
Commission # DD122787
Expires June 20, 2006
Bonded Thru
Atlantic Bonding Co., Inc.

CONSENT TO ASSIGNMENT AND ASSUMPTION OF LEASES

The BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, the Lessor of the property described in the Leases consents to the foregoing Assignment and Assumption of Leases this 22nd day of December, 2003.

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

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

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 22nd day of Dec, 2003, by Gloria C. Nelson, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust fund of the State of Florida. She is personally known to me.

(SEAL)

Theresa M. Brady
Notary Public, State of Florida

Print/Type Notary Name

Commission Number:

Commission Expires:

Theresa M. Brady
Commission # DD081826
Expires Jan. 2, 2006
Bonded Thru
Atlantic Bonding Co., Inc.

Approved as to Form and Legality

By: _____
DEP Attorney

(1) 4084

SAL8101

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

LEASE AGREEMENT
CRYSTAL RIVER STATE BUFFER PRESERVE

Lease No. 4084

This lease is made and entered into this 7th day of March 1996, 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 DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF MARINE RESOURCES, hereinafter referred to as "LESSEE".

WITNESSETH:

WHEREAS, the BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA holds fee 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, for and in consideration of the mutual covenants and agreements hereinafter contained, LESSOR leases the below described premises to LESSEE subject to the following terms and conditions:

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

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

3. TERM: The term of this lease shall be for a period of

fifty (50) years, commencing on March 7, 1996 and ending on March 6, 2046, unless sooner terminated pursuant to the provisions of this lease.

4. PURPOSE: LESSEE shall manage the leased premises only as a state buffer preserve, 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, Bureau of Land Management Services, Department of Environmental Protection, Mail Station 130. 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 on the effective date of this lease which established the primary public purpose for which the leased premises are to be managed. 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 Land Management Services, Division of State Lands, Department of Environmental Protection, 3900 Commonwealth Boulevard, Mail Station 130, 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. LESSEE is responsible for all personal injury and property damage attributable to the negligent acts or omissions of LESSEE and its officers, employees and agents.

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 Division of Historical Resources of the Department of State. 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 easements 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 expiration or termination 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, LESSEE shall give written notification to the Bureau of Land Management Services, Division of State Lands, Department of Environmental Protection, 3900 Commonwealth Boulevard, Mail Station 130, Tallahassee, Florida 32399, at least six (6) months prior to the release of any or all 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, Department of Environmental Protection, shall perform an on-site inspection and the keys to any buildings on the leased premises shall be turned over to the Division of State Lands. If the leased premises do not meet all conditions as set forth in paragraphs 18 and 21 herein, LESSEE shall, at its expense, pay all cost 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 or other land managing agencies for the protection and enhancement of the leased premises.

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

17. MINERAL RIGHTS: This lease does not cover petroleum or petroleum products or minerals and does not give the right to LESSEE to drill for or develop the same, and LESSOR specifically reserves the right to lease the leased premises for purposes of exploring and recovering oil and minerals by whatever means appropriate; provided, however, that LESSEE shall be fully compensated for any and all damages that might result to the leasehold interest of LESSEE by reason of such exploration and recovery operations.

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 and 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, maintaining the planned improvements as set forth in the approved Management Plan, meeting all building and safety codes in the location situated, keeping the leased premises free of trash or litter and maintaining any and all existing roads, canals, ditches, culverts, risers and the like in as good condition as the same may be on the effective date of this lease.

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 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 to be done 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: (A) LESSEE shall not do, or suffer to be done, in, on or upon the leased premises or as affecting said leased premises or adjacent properties, any act which may result in damage or depreciation of value to the leased premises or adjacent properties, or any part thereof. (B) Lessee shall not generate, store, produce, place, treat, release or discharge any contaminants, pollutants or pollution, including, but not limited to, hazardous or toxic substances, chemicals or other agents on, into, or from the leased premises or any adjacent lands or waters in any manner not permitted by law. For the purposes of this lease, "hazardous substances" shall mean and include those elements or compounds defined in 42 U.S.C. Section

9601 or which are contained in the list of hazardous substances adopted by the United States Environmental Protection Agency (EPA) and the list of toxic pollutants designated by the United States Congress or the EPA or defined by any other federal, state or local statute, law, ordinance, code, rule, regulation, order or decree regulating, relating to, or imposing liability or standards of conduct concerning any hazardous, toxic or dangerous waste, substance, material, pollutant or contaminant. "Pollutants" and "pollution" shall mean those products or substances defined in Chapters 376 and 403, Florida Statutes and the rules promulgated thereunder, all as amended or updated from time to time. In the event of LESSEE's failure to comply with this paragraph, LESSEE shall, at its sole cost and expense, promptly commence and diligently pursue any legally required closure, investigation, assessment, cleanup, decontamination, remediation, restoration and monitoring of (1) the leased premises, and (2) all off-site ground and surface waters and lands affected by LESSEE's such failure to comply, as may be necessary to bring the leased premises and affected off-site waters and lands into full compliance with all applicable federal, state or local statutes, laws, ordinances, codes, rules, regulations, orders and decrees, and to restore the damaged property to the condition existing immediately prior to the occurrence which caused the damage. LESSEE's obligations set forth in this paragraph shall survive the termination or expiration of this lease. Nothing herein shall relieve LESSEE of any responsibility or liability prescribed by law for fines, penalties and damages levied by governmental agencies, and the cost of cleaning up any contamination caused directly or indirectly by LESSEE's activities or facilities. Upon discovery of a release of a hazardous substance or pollutant, or any other violation of local, state or federal law, ordinance, code, rule, regulation, order or decree relating to the generation, storage, production, placement, treatment, release or discharge of any contaminant, LESSEE shall report such violation to all applicable governmental agencies having jurisdiction, and to LESSOR, all

within the reporting periods of the applicable governmental agencies.

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 materialman'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, handicaps, 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. ADMINISTRATIVE FEE: LESSEE shall pay LESSOR an annual administrative fee of $300.00. The initial annual administrative fee shall be payable within 30 days from the date of execution of this lease agreement and shall be prorated based on the number of months or fraction thereof remaining in the fiscal year of execution. For purposes of this lease agreement, the fiscal year shall be the period extending from July 1 to June 30. Each annual payment thereafter shall be due and payable on July 1 of each subsequent year.

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

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

Hallie I. Suber
Witness
HALLIE I. SUBER
Print/Type Witness Name

By: Daniel T. Crabb (SEAL)
CHIEF, BUREAU OF LAND MANAGEMENT SERVICES, DIVISION OF STATE LANDS, DEPARTMENT OF ENVIRONMENTAL PROTECTION

Nikeya N. Hill
Witness
Nikeya N. Hill
Print/Type Witness Name

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 7th day of March 1996, by Daniel T. Crabb, as Chief, Bureau of Land Management Services, Division of State Lands, Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. He is personally known to me.

Patricia Toloday
Notary Public, State of Florida

(SEAL)

Print/Type Notary Name

OFFICIAL NOTARY SEAL
PATRICIA TOLODAY
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC191699
MY COMMISSION EXP. APR. 18,1996

Commission Number:

My Commission Expires:

Approved as to Form and Legality

By: Sandra L. Heiser
DEP Attorney

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF MARINE RESOURCES

Hazel H. Jones
Witness
HAZEL H. JONES
Print/Type Witness Name

STEPHEN C ADAMS
Witness
Print/Type Witness Name

BY: _____ (SEAL)
Edwin J. Conklin
Print/Type Name

Title: Director

"LESSEE"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 29th day of February 1996, by Edwin J. Conklin, as Director of the Division of Marine Resources, State of Florida Department of Environmental Protection. He/she is personally known to me or who has produced (personally known) as identification.

Evelyn Kathleen Ethridge
Notary Public, State of Florida

(SEAL)

EVELYN KATHLEEN ETHRIDGE
MY COMMISSION # CC257104 EXPIRES
February 3, 1997
BONDED THRU TROY FAIN INSURANCE, INC.

Evelyn Kathleen Ethridge
Print/Type Notary Name

Commission Number: CC257104

My Commission Expires: February 3, 1997

Appendix 2

Chapter 62D-2
Operation of Division of Recreation and Parks
Recreation Areas and Facilities

DIVISION OF RECREATION AND PARKS

CHAPTER 62D-2
OPERATION OF DIVISION RECREATION AREAS AND FACILITIES

62D-2.013 Park Property and Resources.

(1) Objective. All state parks have been established for the protection and preservation of their natural features or historic significance and for public use and enjoyment of the areas and facilities. The objective of these rules is to provide maximum public use consistent with the preservation of the natural features and historic value. State parks include all real property in the State of Florida under the jurisdiction of the Florida Department of Environmental Protection, Division of Recreation and Parks, or which may come under its jurisdiction regardless of the property's designation. Among the designations included in the state park system are state park, state recreation area, state archaeological site, state historic site, state geological site, state botanical site, state preserve, state garden, state museum, state reserve, state cultural site, state wildlife park, state folk culture center, and state trail. For purposes of this chapter, Department shall mean the Department of Environmental Protection, and Division shall mean the Division of Recreation and Parks of the Department.

(2) Removal or Destruction of Park Property and Resources. No person shall destroy, injure, deface, mar, move, dig, harmfully disturb or remove from any park area, or the waters thereof, any buildings, structures, facilities, historic ruins, equipment, park property, soil, sand, gravel, rocks, stones, minerals, marine plants or animals, artifacts, or other materials. No person shall cut, carve, injure, mutilate, move, displace, or break off any water bottom formation or growth. Nor shall any person possess, break off, or in any way damage any stalactites, stalagmites or other cave formations. No rope, wire, or other contrivance whether permanent or temporary, shall be attached to any natural feature or property within a park.

(3) Fires. No person shall ignite or attempt to ignite any fire against or on any vegetation or park structures, except in designated fireplaces or grills. No person shall dispose of burning matches, smoking materials or other inflammable items within any park except in designated receptacles. Prescription burning shall be conducted by the Division where appropriate for the restoration, maintenance and preservation of certain plant communities.

(4) Plant Life.

(a) All plant life, terrestrial, aquatic, and aerial, is the property of the State of Florida. No person shall cut, carve, or damage the bark, or break off limbs or branches or mutilate in any way, or pick the flowers or seeds of any plant or tree. Nor shall any person dig in or otherwise disturb grass areas or in any other way impair the natural condition of any area; nor shall any person place debris or materials of any kind on or about any tree or plant.

(b) No person shall transplant or remove any plant life from any park, except as provided herein. The Division shall control invasive exotic plants where appropriate for the restoration, maintenance, and preservation of native plant communities.

(5) Animal Life.

(a) No person shall possess, molest, harm, frighten, kill, trap, hunt, chase, capture, shoot or throw any object at any mammal, bird, reptile, amphibian, or any other animal except as provided for in paragraph (d) below; nor shall any person remove the eggs, nest or young of any such animal; nor shall any person collect, remove, possess, give away, sell or offer to sell, or buy or offer to buy, or accept as gift, any specimen, alive or dead, of the groups of tree snails. The public is prohibited from killing, capturing, or molesting poisonous snakes. Park personnel are authorized to remove poisonous snakes from public areas of parks.

(b) No person shall feed or attempt to pet any wild animal.

(c) No person shall capture, collect, or in any way harm any animal life, except fish commonly referred to as edible or game species or as otherwise provided herein.

(d) Hunting and fishing in reserves may be allowed where substantial fish and wildlife habitat and resources exist. Management activities which maintain a natural diversity of plant and animal species will be encouraged. All fishing and hunting will be in accordance with paragraphs 62D-2.014(9) and (10). Hunting is prohibited in all state parks, state recreation areas, state archaeological sites, state historic sites, state geological sites, state botanical sites, state preserves, state museums, state cultural sites, state wildlife parks, state folk culture centers, state trails and state gardens.

(6) Introduction of Species. No person shall introduce into any park any plant or animal species by willful abandonment, negligence or for any other reason without authorization of the Division. Authorization shall be granted when the Division determines that the activity is consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes, and in keeping with protection, restoration, and maintenance of natural resources. Authorization may be obtained only by submitting a written request to the Division of Recreation and Parks, MS 500, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

(7) Collection of Specimens. A permit must be obtained for the collection of natural objects, including plant and animal life and minerals. A permit shall be issued if such collection is for scientific or educational purposes; and the Division determines that it provides some benefit to the Division for management purposes (such as provision of a copy of the scientific report generated to the Division); is not harmful to park resources; and is consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes. Collection shall be conducted in compliance with the terms of the written permit. Permits shall be applied for by submitting a written

request to the Division of Recreation and Parks, MS 500, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

(8) Construction Activity. No person shall commence or conduct any construction activities upon any land or water areas under the jurisdiction of the Division, without first obtaining authorization from the Division. Authorization shall be granted only in cases where the construction activity is consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes, and in keeping with protection, restoration, and maintenance of natural resources. Authorization may be obtained only by submitting a written request to the Division of Recreation and Parks, MS 500, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

(9) Public Utilities. Public utilities serving park property or traversing park property shall be designed, constructed and maintained as follows:

(a) Rights-of-way shall be as narrow as utility regulations permit, and kept free of invasive non-native plant species,

(b) Maintenance (trimming or removal) of vegetation shall occur no more often than minimally required for safe utilities transmission,

(c) Small trees, shrubs and other vegetation shall be left undisturbed except that a fifteen foot wide service road may be mowed, within the right-of-way,

(d) Trees that will interfere with power lines shall be cut or trimmed only as authorized by the park manager,

(e) Large volunteer trees that are threatening buried gas lines shall be cut only as authorized by the park manager,

(f) Easements crossing fire adapted plant communities shall be burned the same as the adjacent community,

(g) The utility company maintenance foreman shall consult with the park manager prior to undertaking routine maintenance to insure that only minimum trimming is accomplished, and

(h) Only herbicides approved by the park manager shall be used. The application of herbicides shall be confined to the utility easement and not adversely affect adjacent park resources.

Specific Authority 258.007(2) FS. Law Implemented 258.004, 258.007(2), (3), (4), 258.017, 258.037, 258.083 FS. History—New 4-16-96, Amended 4-14-98, 12-19-99.

62D-2.014 Activities and Recreation.

(1) Regulation of Recreation Activities. The Division, in furtherance of the policy and intent of Chapter 258, Florida Statutes, may prohibit or regulate any activity that lessens the safety or recreational experience of the visiting public or lessens the natural or cultural value of the park. Except as provided herein, all recreational activities will occur at such locations as designated for specific uses by the Division.

(2) Park Entrance Rules and User Fees.

(a) Entering State Park Property. Entering or leaving any state park property except through the designated entrance points (except in emergency cases) is prohibited. No person may enter a state park property for the purposes of using the resources or facilities therein without paying the appropriate fee, if any, in effect at the time for that park property. A full stop shall be made at the Ranger Station when entering a state park.

(b) Fees. Admission fees shall be waived by authorized Division personnel for representatives of any government agency and for salesmen, tradesmen or other individuals who will benefit the park or state park system and who present proper identification. Admission fees shall also be waived for:

1. Children under six years of age;

2. Patients of Florida State Mental Institutions and clients of the Department of Juvenile Justice and the Department of Children and Family Services, and other similar institutions which are fully funded by federal, state, or local government, when such patients and/or clients are part of an organized group or program under the sponsorship and supervision of their respective institutions or parent agencies;

3. Florida school groups, including vocational schools, colleges and universities, accompanied by one or more teachers, and bearing a letter from the school principal, professor or other appropriate official, certifying that the park visit is related to a specific school curriculum and is for educational purposes rather than a purely recreational outing;

4. Division employees and their families;

5. The Division also offers a fifty percent discount on base camping fees to Florida citizens who are at least 65 years of age or Florida citizens possessing a current Social Security disability award certificate or proof of a 100% disability award from the Federal government or other acceptable proof of 100% disability.

(c) The Division Director shall recommend standard admission and other park fees, taking into consideration the following factors:

1. User demand;

2. Location of the park, including distance from major metropolitan areas;

3. Cost of managing and operating the park;

4. Type of facilities available;

5. Season; and

6. Natural and historic resource values of the park.

(d) User fees shall become effective after they are advertised in a general statewide news release, and, if requested, reviewed at a public hearing, and approved in writing by the Secretary of the Department. Copies of the current fee schedule may be obtained from State Park offices or by writing to the Division at MS 500, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

(3) Traffic Control. Authorized law enforcement officers and park personnel shall direct traffic in parks and on roads adjacent thereto as conditions warrant. All persons shall comply with lawful orders, signals, and direction of such officers and personnel. All persons shall observe and comply with posted traffic control devices and signs.

(4) Speed of Vehicles in Parks. No person shall drive a vehicle at a speed greater than is reasonable or prudent, having due regard for the surface, width and condition of paving and the traffic thereon, particularly when near children or bicyclists. Speed shall not exceed 25 miles per hour, and at the more congested centers and near park buildings, beaches, campgrounds, and picnic and play areas, it shall not exceed 15 miles per hour or as otherwise posted.

(5) Restriction to Roads. No person shall drive any vehicle on any area except designated roads, parking areas, or other such designated areas.

(6) Parking. All vehicles shall be parked only in established parking areas or in such other areas and at such times as the Division may designate.

(7) Bathing and Swimming.

(a) No individual shall swim, bathe, or wade in any

waters at such places designated as prohibited for such activity by the Division. All such activities shall be in compliance with this chapter.

(b) In every area of a park including bathing areas no individual shall expose the human, male or female genitals, pubic area, the entire buttocks or female breast below the top of the nipple, with less than a fully opaque covering.

(8) Boating.

(a) No person shall operate watercraft regardless of means of propulsion upon any park watercourse, bay, lagoon, lake, canal, pond, slough, or those sovereign submerged lands lying within 400 feet of the Mean High Water or Ordinary High Water Line within the riparian lines of any state park unit in places designated by the Division as closed for such purposes.

(b) No watercraft shall be launched into or removed from any park waters, except at places designated for such purpose by the Division.

(c) No person shall moor, anchor or tie up to any buoy, marker, bank or any wharf, dock, tree, building or other object or structure on the bank, any watercraft of any kind in waters within or contiguous to park areas within one hundred feet of the shoreline, in areas designated by the Division as closed for such purposes. This restriction does not apply to vessels of a law enforcement agency of a local, state, or federal government.

(d) No person other than a Division employee or a concessionaire of the Division shall rent or hire, for profit or charge, any kind of watercraft in any park waters. Nor shall any watercraft operating for hire or carrying passengers for a fee, or contemplating such, land or receive such passengers at any dock, wharf or anchorage within jurisdiction of the Division except by permit. Permits shall be issued only when no concession agreement exists or when the concessionaire does not wish to provide the services requested. Permits shall be issued when it is determined by the Division that the request to provide this service would not adversely affect park resources, would be consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes, and would provide a needed visitor service. Permits shall be applied for in the same manner as in subsection 62D-2.013(7), herein.

(e) No person operating passenger launches or excursion boats from outside the parks that are for rent or hire or carrying passengers for money shall land or anchor or tie up in any park without first having applied for and received a permit from the Division. Permits shall be issued when it is determined by the Division that the request to provide this service would not adversely affect park resources, would be consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes, and would provide a needed visitor service. Permits shall be applied for in the same manner as in subsection 62D-2.013(7), herein. All persons operating such watercraft shall be subject to all Division boating rules.

(9) Fishing.

(a) Fishing is allowed in park waters, by any legal method, except where prohibited by the Division and under the provisions of this chapter. Any device which is employed to remove, capture, or attempt to capture fish in any waters closed to fishing or any device otherwise used in violation of this chapter shall be seized and confiscated by law enforcement officers.

(b) Under the provisions of this chapter commercial fishing for food and bait fish is allowed in the John Pennekamp Coral Reef State Park, St. Lucie Inlet State Park and those sovereign submerged lands lying within 400 feet of the Mean High Water or Ordinary High Water Line within the riparian lines of any state park unit under Division jurisdiction, except as prohibited in Rule 62D-2.014(1).

(c) All fishing in John Pennekamp Coral Reef State Park is subject to Florida Fish and Wildlife Conservation Commission Rule 46-5.002, Florida Administrative Code, and provisions of Rule 62D-2.

(d) Spearfishing is prohibited in all state parks.

(10) Hunting and Firearms. Hunting, trapping or the pursuit of wildlife is prohibited on all park property, except in Reserves, as authorized by the Florida Fish and Wildlife Conservation Commission. No person shall use, carry, or possess in any park weapons such as firearms of any type, air rifles, spring guns, bows and arrows, gigs (except in areas where gigs may be legally used for saltwater fishing), sling shots, or any other forms of weapons or trapping devices potentially dangerous to wildlife or human safety except when such weapons or traps are used for resource management purposes as authorized in this subsection. Shooting into park areas from beyond park boundaries is prohibited. Any device which is employed to kill, immobilize, or capture any wildlife or any device otherwise used in violation of this chapter shall be seized and confiscated by law enforcement officers. The Division may authorize the control of nuisance animals and may remove all exotic animals from parks by trapping and other necessary means for park resource management purposes. Such authorization shall be in the form of a license, permit, or contract negotiated by the parties or made pursuant to an advertised bid by the Division. Authorization may be obtained in the same manner as stated in 62D-2.013(7), herein.

(11) Subleases of Certain Properties. The Division may sublease certain properties, or portions thereof, to other state, county or local governmental agencies for management purposes subject to approval by the Board of Trustees of the Internal Improvement Trust Fund in accordance with ss. 253.034(4), Florida Statutes. The terms and conditions of the sublease shall control the use and management of the property.

(12) Alcoholic Beverages. Possession and consumption of alcoholic beverages within any park during established operating hours are prohibited except in those facilities such as restaurants and lodges.

(13) Domestic Animals.

(a) Domestic animals shall be regulated in parks at any time when appropriate to enhance the recreational experience of other visitors or to protect the parks' resources.

(b) Domestic breeds of dogs, cats and other fur-bearing pets, except dog guides, service dogs and nonhuman primates of the genus *cebus*, which are trained and registered for assisting the physically impaired, shall be excluded from the following places in a park: food-service areas, designated camping areas, cabins, bathing and swimming areas including land and water portions, park buildings, playgrounds, and other designated areas. Pets are permitted in all other areas subject to the following restrictions:

1. All pets must be confined, leashed, or otherwise under the physical control of a person at all times. Leashes may

not exceed six feet in length. This rule does not apply to horses and pack animals brought in for equestrian trail use.

2. Pets must be well behaved at all times. Pets must be confined in the owner's camping unit during designated quiet hours. Unconfined pets may not be left unattended for more than 30 minutes and must be leashed.

3. Pet owners shall pick up after their pets and properly dispose of all pet droppings in trash receptacles.

4. Pets which are noisy, vicious, dangerous, disturbing or intimidating to other persons, and pets which damage park resources are considered to be nuisances and will not be permitted to remain in the park.

5. Owners of dogs and cats and other pets, required by Florida Law to be vaccinated against rabies, must provide proof of rabies vaccination when registering to camp.

(c) Camping areas and other park areas will be evaluated, as to the suitability of pets, on a periodic basis as part of the unit management planning process. Areas of the park designated as prohibited for pets shall be determined based on park natural and cultural resources, primary recreational activities, camper and pet health and safety, geographical location and layout of camping areas, and the ability to provide a quality recreational experience for all visitors. A fee will be charged for each pet accompanying a camping party.

(14) Merchandising. No person shall offer for sale any article or material, nor place any stand, cart, or vehicle for the transportation, sale or display of any article or material for sale within any state park unless authorized by the Division. Authorization shall be issued when park resources are not adversely affected, existing contractual relationships are not impaired, a needed visitor service is provided, and the activity would be consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes. Authorizations may be obtained in the same manner as stated in 62D-2.013(7), herein.

(15) Aircraft. No person operating or responsible for any aircraft, glider, balloon, parachute, or other aerial apparatus shall cause any such apparatus to take off from or land in any park except in an emergency when human life is endangered or where a designated landing facility may exist on park property.

(16) Hours.

(a) The opening and closing hours for each park shall be posted. No person shall remain in any park after closing unless properly registered as an overnight visitor or in possession of a valid after hours permit from the Division or park manager. Said permits may be obtained from the park office where such after hours use is offered.

(b) The Division, in furtherance of the park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes, may close any park or section thereof to the public at any time and for any interval of time, either temporarily or at regular stated intervals and either entirely or only for certain uses. Park closures will be used to provide visitor and employee safety, resource protection, operational efficiency, and facility maintenance. No person shall remain in any closed park or section thereof, unless authorized by the Division or park manager, or their delegee. Verbal authorization shall be granted by the Division, the park manager, or their delegee, when it is in the best interest of the park, or of the person remaining in the closed area, for safety, protection, construction, or restoration purposes.

(17) Photography. All commercial photography, motion pictures, and other media production activities are prohibited without a permit from the Division. All private photography involving special settings or structures (such as use of exotic animals or attachments to park lands) which adversely impacts park resources or public recreational activities is prohibited without authorization by the Division. Permits for these activities shall be issued if the activity is consistent with park management practices as stated in ss. 258.004, 258.007, 258.017 and 258.037, Florida Statutes, and the activity would not disrupt normal park operation, adversely impact the park's resources, or disrupt the public's normal enjoyment of the park. Permits may be obtained at the park for which the permit is desired and after approval by the park manager of requested photographic arrangements and receipt of published fees. A state parks fee schedule may be obtained by writing to the Division of Recreation and Parks, MS 500, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000. All activity under the permit is subject to the terms and conditions listed on the permit and to the provisions of Rule 62D-2. The time and exact location within a park for photography shall be mutually satisfactory to the park manager and the permittee. All other private photography is encouraged.

Commercial photography productions and related activities which would disrupt normal park operations, adversely impact the park's resources, or disrupt the public's normal enjoyment of the park shall require a contract. The terms of the contract shall be negotiated with the Division and must result in a net positive benefit to the park. This subsection is not intended to, and shall not, impair any constitutional right of free speech.

(18) Free Speech Activities. Free speech activities include, but are not limited to, public speaking, performances, distribution of printed material, displays, and signs. Free speech activities do not include activities for commercial purposes. Any persons engaging in such activities can determine what restrictions as to time, place, and manner may apply, in any particular situation, by contacting the park manager. Free speech activities shall not create a safety hazard or interfere with any other park visitor's enjoyment of the park's natural or cultural experience. The park manager will determine the suitability of place and manner based on park visitor use patterns and other visitor activities occurring at the time of the free speech activity.

Specific Authority 258.007(2) FS. Law Implemented 258.004, 258.007(1), (2), (3), 258.014, 258.016, 258.017, 258.037 FS. History—New 4-16-96, Amended 4-14-98, 12-19-99.

ANNOTATIONS

Validity

The court affirmed the order of the Administrative Law Judge finding that the challenged rule, subsection 62D-2.014(18), F.A.C., was a valid exercise of delegated legislative authority. Furthermore, the court held that the rule was not an unconstitutional restriction on free speech. Frandsen v. Department of Environmental Protection, 24 FALR 4203 (2002).

DOAH dismissed the petition to declare subsection 62D-2.014(18), F.A.C., invalid. DOAH ruled that the rule was not vague, did not fail to establish adequate standards for Division of Recreation and Parks decisions, and did not vest unbridled discretion in the Division. Furthermore, the Division had not exceeded its grant of rulemaking authority. Marvin Vaun Frandsen v. Department of Environmental Protection, 24 FALR 1410 (2001).

STATE OF FLORIDA
DEPARTMENT OF STATE

Division of Elections

I, GLENDA E. HOOD, Secretary of State of the State of Florida, do hereby certify that the above and foregoing is a true and correct copy of Chapter 62D-2, Florida Administrative Code, rules and regulations of the Department of Environmental Protection filed pursuant to Chapter 120, Florida Statutes, as shown by the records of this office.

Given under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capitol, this the 31st. day of October, A.D., 2003.

Glenda E. Hood

Secretary of State

DSDE 99 (3/03)

Appendix 3

Acquisition History of the Crystal River Preserve State Park

Type	Deed Date	Lease Date	Owner	Acreage
Donation	20-Aug-74	7-Mar-96	Crystal River Development Corporation	13.84
Donation	20-Aug-74	7-Mar-96	Crystal River Development Corporation	9.01
Purchase	20-Aug-74	7-Mar-96	Crystal River Development Corporation	16.57
Donation	20-Aug-74	7-Mar-96	Crystal River Development Corporation	24.66
Donation	20-Aug-74	7-Mar-96	Crystal River Development Corporation	2.57
Donation	20-Aug-74	7-Mar-96	Crystal River Development Corporation	49.54
Purchase	20-Aug-74	7-Mar-96	Crystal River Development Corporation	15.51
Purchase	25-Mar-83	7-Mar-96	Crystal River Yacht Club	4.59
Purchase	25-Mar-83	7-Mar-96	Crystal River Yacht Club	1.21
Purchase	25-Mar-83	7-Mar-96	Crystal River Yacht Club	0.20
Purchase	25-Mar-83	7-Mar-96	Alston Farms	0.33
Purchase	25-Mar-83	7-Mar-96	Alston Farms	20.00
Purchase	25-Mar-83	7-Mar-96	Alston Farms	0.28
Purchase	25-Mar-83	7-Mar-96	Alston Farms	0.22
Purchase	25-Mar-83	7-Mar-96	Alston Farms	0.22
Purchase	25-Mar-83	7-Mar-96	Alston Farms	0.26
Purchase	25-Mar-83	7-Mar-96	Crystal River Investors (Williams)	238.00
Purchase	25-Mar-83	7-Mar-96	Alston Farms	0.30
Purchase	12-Oct-84	7-Mar-96	Sunstyle Homes	1.00
Purchase	16-Oct-84	7-Mar-96	Crystal Lakes Ltd.	100.00
Purchase	16-Oct-84	7-Mar-96	Crystal Lakes Ltd.	100.00
Purchase	16-Oct-84	7-Mar-96	Crystal Lakes Ltd.	509.00
Purchase	16-Oct-84	7-Mar-96	Crystal Lakes Ltd.	160.00
Purchase	16-Oct-84	7-Mar-96	Crystal Lakes Ltd.	345.00
Purchase	27-Dec-84	7-Mar-96	Policastro	235.00
Purchase	27-Dec-84	7-Mar-96	Policastro	120.00
Purchase	20-Mar-86	7-Mar-96	Tolle	55.60
Purchase	27-Oct-88	7-Mar-96	Suncoast Shores	786.71
Purchase	23-Jan-90	7-Mar-96	Steigler	0.35
Purchase	19-Jul-90	7-Mar-96	Arfaras et al	9.42
Purchase	13-Oct-95	7-Mar-96	Ducros 76	266.49
Purchase	13-Oct-95	7-Mar-96	Ducros 72	50.23
Donation	04-Dec-95	29-Mar-96	Corrigan	576.72
Exchange	01-Oct-75	2003	Homosassa Springs Inc.	95.40
Donation	24-Nov-81	2003	The Nature Conservancy	525.91
Donation	08-Nov-84	2003	Riverview Mobile Estates	74.00
Donation	22-Dec-87	2003	Galley	0.75
Donation	17-Feb-88	2003	Dixie Crab Company	0.87
Purchase	08-Apr-88	2003	Stoney-Lane	1373.77
Purchase	09-Dec-91	2003	Crystal River Grund.	863.47
Purchase	31-Dec-91	2003	SRC 17	445.22

Purchase	14-Mar-92	2003	Paradise Acres	583.41
Purchase	25-Mar-92	2003	Rawson	55.33
Purchase	27-Mar-92	2003	Schoenrock	639.90
Purchase	30-Mar-92	2003	Katz	79.05
Purchase	21-Apr-92	2003	Harlow H. Land	1356.18
Purchase	14-May-92	2003	Schoenrock	189.68
Purchase	21-May-92	2003	Lightfoot	129.18
Purchase	29-May-92	2003	Lutheran Ministries et al	464.57
Purchase	05-Aug-92	2003	Railway Marketing Corp.	7.10
Purchase	11-Aug-92	2003	Greenleaf Bay	372.56
Purchase	23-Sep-92	2003	Houle	795.61
Purchase	15-Dec-92	2003	St. Christopher’s Episcopal Church	86.67
Purchase	03-Feb-93	2003	Gavin	20.00
Purchase	04-Feb-93	2003	Koger	200.00
Purchase	25-Mar-93	2003	G&S Development/Sterchi	575.63
Purchase	28-Apr-93	2003	Catlett/Meares	38.00
Purchase	02-Jun-93	2003	Corrigan	21.23
Purchase	15-Jul-93	2003	Berkowitz	444.58
Purchase	01-Aug-93	2003	Nationsbank/Garby, et al	1442.46
Purchase	28-Mar-94	2003	Strickland	0.22
Purchase	18-May-94	2003	Smith	49.60
Purchase	25-Jul-94	2003	Houllis	15.00
Purchase	11-Aug-94	2003	Guthrie	0.27
Purchase	23-Aug-94	2003	Donart	0.77
Purchase	23-Aug-94	2003	Edwards	0.21
Purchase	13-Sep-94	2003	Regnvall	0.20
Donation	11-Oct-94	2003	Porter	3.00
Purchase	17-Oct-94	2003	Andress	0.30
Purchase	21-Oct-94	2003	Zellner	63.12
Purchase	24-Oct-94	2003	Anslow/Milan	52.96
Purchase	30-Nov-94	2003	Mercer	48.89
Purchase	30-Nov-94	2003	Boggs et al	17.20
Purchase	01-Dec-94	2003	SRC 46/51	168.79
Purchase	01-Dec-94	2003	UFF	24.15
Purchase	05-Dec-94	2003	Smith	1.43
Donation	09-Dec-94	2003	SRC	12.00
Donation	12-Dec-94	2003	Davis	1.00
Donation	19-Dec-94	2003	Becker	4.06
Purchase	26-Jul-89	2003	United States of America	316.26
Purchase	26-Jul-89	2003	United States of America	13.27
Purchase	26-Jul-89	2003	United States of America	423.61
Purchase	09-Sep-91	2003	United States of America	256.10
Purchase	09-Sep-91	2003	United States of America	80.00
Purchase	09-Sep-91	2003	United States of America	80.00
Purchase	09-Sep-91	2003	United States of America	181.33

Purchase	09-Sep-91	2003	United States of America	3.65
Purchase	09-Sep-91	2003	United States of America	383.28
Purchase	09-Sep-91	2003	United States of America	30.52
Purchase	09-Sep-91	2003	United States of America	186.50
Purchase	09-Sep-91	2003	United States of America	24.42
Purchase	09-Sep-91	2003	United States of America	358.44
Purchase	09-Sep-91	2003	United States of America	36.80
Purchase	09-Sep-91	2003	United States of America	7.31
Purchase	09-Sep-91	2003	United States of America	527.20
Purchase	09-Sep-91	2003	United States of America	596.32
Purchase	09-Sep-91	2003	United States of America	44.50
Purchase	09-Sep-91	2003	United States of America	2.80
Purchase	09-Sep-91	2003	United States of America	209.59
Purchase	17-Jan-95	2003	Harlow H. Land	450.28
Purchase	27-Jan-95	2003	Crystal River Grund.	76.00
Purchase	03-Feb-95	2003	Gustke	5.85
Purchase	03-Feb-95	2003	Successful Enterprises	5.14
Purchase	03-Feb-95	2003	Browning 61	5.43
Purchase	06-Feb-95	2003	Partridge	5.60
Purchase	06-Feb-95	2003	Browning 56	19.17
Purchase	06-Feb-95	2003	Browning 54/55	63.37
Purchase	06-Feb-95	2003	Browning 60	5.43
Purchase	07-Feb-95	2003	Browning 62	4.68
Purchase	13-Feb-95	2003	Browning 71	47.14
Purchase	13-Feb-95	2003	Browning 70	17.95
Purchase	13-Feb-95	2003	Browning 65	21.53
Purchase	13-Feb-95	2003	Jury	23.65
Purchase	14-Feb-95	2003	Nichols	5.71
Purchase	14-Feb-95	2003	Briggs	5.84
Purchase	03-Mar-95	2003	Corrigan 95	628.12
Purchase	03-Mar-95	2003	Bywater/Sunbank	511.42
Purchase	27-Jun-95	2003	Preston	9.98
Purchase	15-Dec-95	2003	Scofield	16.95
Donation	28-Dec-95	2003	Wells	2.50
Purchase	29-Dec-94	14-Mar-97	Hollins	4795.47
Purchase	11-Sep-96	21-Apr-97	Koran	3.22
Purchase	18-Mar-97	3-Apr-98	Burnup & Sims	552.04
Purchase	26-Aug-98	7-Dec-98	River Marina (Yacht Club)	4.38
Purchase	14-Sep-98	7-Dec-98	Souria	12.21
Purchase	15-Sep-98	7-Dec-98	Sunbank/Williams	8.35
Purchase	15-May-95	26-Aug-99	Adcock/Hollins	4.38
Purchase	15-May-95	26-Aug-99	Adcock/Hollins	515.74
Purchase	15-May-95	26-Aug-99	Adcock/Hollins	6.20
Purchase	29-Jun-95	26-Aug-99	Penrose	193.52
Purchase	15-Oct-98	26-Aug-99	Zuban 57	6.20

Purchase	10-Dec-98	26-Aug-99	AHR (Scrub)	386.08
Purchase	15-Dec-98	26-Aug-99	Moste	69.40
Purchase	28-Dec-98	26-Aug-99	Sunbank/Williams	6.11
Purchase	30-Apr-99	26-Aug-99	Browning 52	1.63
Purchase	30-Apr-99	26-Aug-99	Browning 53	1.55
Purchase	28-May-99	26-Aug-99	Browning 62	31.66
Donation	09-Nov-98	12-Oct-01	Grube	115.00
Donation	12-May-99	12-Oct-01	Malzone	5.00
Purchase	08-Jun-00	12-Oct-01	Suntrust/Williams	81.97
Purchase	17-Aug-00	12-Oct-01	Tolle	5.50
Purchase	17-Aug-00	12-Oct-01	Tolle	3.20
Purchase	18-Nov-00	12-Oct-01	Hawkins 228	5.05
Purchase	30-Nov-00	12-Oct-01	Hawkins	5.00
Purchase	30-Nov-00	12-Oct-01	Hawkins	5.80
Donation	11-Dec-00	12-Oct-01	Schulz	0.76
Purchase	14-Dec-00	12-Oct-01	Stinnette	1.10
Exchange	27-Dec-00	12-Oct-01	Citrus Mining and Timber (Hollins)	77.40
Purchase	30-Jan-01	12-Oct-01	Tillman	0.39
Purchase	21-Feb-01	12-Oct-01	Browning	0.85
Purchase	13-Aug-01	12-Oct-01	Brennan	2.20
Donation	05-Dec-01	8-Aug-02	Home Depot	103.71

Appendix 4

Public Involvement in the Land Management Plan Preparation

Crystal River Preserve State Park
Public Workshop Summary

The public workshop to present the proposed land management plan for Crystal River Preserve State Park was held on August 2, 2004 at the Preserve visitor center. Keith Laakkonen represented the Office of Coastal and Aquatic Managed Areas, Nick Robbins, Tom Matthews, Dan Pearson, and Michael Kinnison represented the Division of Recreation and Parks (DRP). A total of nine individuals attended the meeting, including representatives from the Office of Greenways and Trails, Friends of Crystal River Archaeological State Park, and Citrus County:

Kathy Turner Thompson
Steve Kingery
John Kostelnick, Friends of Crystal River Archaeological State Park
Gary Maidhof, Citrus County
Dixie Hollins, Hollinswood Citrus, Mining and Timber
Frank and Mavis Grebenc
Mike Howe, Lotspeich and Associates
Chris McKendree, Office of Greenways and Trails

Keith Laakkonen delivered a presentation was delivered that discussed the preserve's acquisition history, provided an overview of natural and cultural resources, reviewed progress during the last planning cycle, identified management needs and objectives, and identified proposed improvements related to public access. The meeting was then opened for public comment.

Summary of Public Comments

Recreation and Public Access

- What are plans for canoe/kayak access?

Staff explained that improvements were proposed to provide canoe/kayak access at the boat basin and Mullet Hole use area.

- Provide more opportunities (tours, trams, etc.) for vehicular public access for those individuals that cannot hike or bike long distances.

Revenue Generation

- Interested in ideas for generating revenue for the preserve.
- Consider adding a donation box at proposed canoe launch.

Staff explained that receipts from timber sales generate revenue to assist with land management at the preserve. Staff suggested that honor boxes may not be effective at collecting fees given the number of different public access points, and discussed other means of generating funds such as the Help our State Park program and citizen support organizations.

Feral Hogs

- Consider allowing limited hunting to control feral hogs.
- Would like to increase donations of meat to charitable organizations from hogs

removed from the preserve.
- Are current levels of trapping effective?

Staff responded that hunting on lands managed by the DRP is limited to those few units that are designated as state reserves. It was explained that the preserve has relied on staff and a Crystal River Police Officer to remove hogs, and that the meat from captured animals is donated to charitable organizations. It was also explained that the DRP uses a combination of staff, volunteers and private individuals to trap hogs on state park lands. Staff added that formal studies of the effectiveness of trapping on the preserve hog population are not practical given the size of the preserve and that staff gauge trapping success based on physical damage in the field.

Prescribed Fire

- What is the optimum burn rate at the preserve?
- Can other land managing agencies perform burn training on preserve lands?
- Preserve staff should be commended for their communication with the public prior to conducting a prescribed burn.

Staff responded that burn intervals vary according to natural community type and are also affected by environmental conditions. At the preserve, burn intervals are between 1-3 years or 7-12 years depending on community type. It was explained that the preserve has only had an active prescribed fire program since 1997.

Staff stated that the DRP has developed memorandum of understandings with other agencies to improve coordination of burn programs on each others property (covers liability and legal issues). It was also explained that state parks coordinate their burn activities among different units to share staff and other resources. Staff added that the Division of Forestry has ultimate authority in the case of wildfire and that a protocol is being developed to guide DOF wildfire activities on DRP lands.

Management Priorities

- What are the individual management priorities for staff at the preserve?

Staff identified hydrological restoration, prescribed fire and groundcover restoration, monitoring, increased use of technology, maintenance of infrastructure and providing public access and education opportunities as areas of priority at the preserve. Hydrological restoration needs to consider offsite impacts and would focus on adding culverts and shoreline contouring of borrow pits. The high costs of hydrological restoration projects was also noted. Monitoring efforts would focus on developing quantifiable vegetation parameters for gauging success. The need to utilize the full potential of GIS to enhance resource management was noted. Staff indicated that funding of restoration activity has improved the last few years as the legislature recognizes the costs of management once lands have been purchased. The importance of maintaining a long-term view when dealing with land management was also discussed as well as the increasing role volunteers play in assisting public land managers.

Crystal River Preserve State Park

DEP Advisory Group Staff Report

The Advisory Group appointed to review the proposed land management plan for Crystal River Preserve State Park was held at the preserve visitor center on August 3, 2004. Ms. Nancy Smith represented The Honorable Ronald Kitchen, Jr.. The Honorable Josh Wooten, and Jim Bierlly did not attend. All other appointed Advisory Group members were present. Attending staff were Keith Laakkonen, J.D. Mendenhall, Vicky Mendenhall, Nick Robbins, Tom Matthews, Dan Pearson and Michael Kinnison.

Mr. Laakkonen began the meeting by explaining the recent transfer of management authority for the preserve from the Office of Coastal and Aquatic Managed Areas (CAMA) to the Division of Recreation and Parks (DRP). He then asked each member of the advisory group to express his or her comments on the plan.

Summary Of Advisory Group Comments

Gary Maidof (Director, Citrus County Department of Developmental Services) indicated that he had already submitted comments in writing and discussed them at the public workshop on the previous evening. (Mr. Maidof's comments included proposed additions to the listed and invasive animal species lists. He also offered several items for consideration related to management issues, goals and objectives, such as providing limited hunting to control feral hog populations, monitoring techniques for native/non-native carnivores, coordinating with commercial fisherman to remove traps and nets and identifying of lands for less-than-fee acquisition.)

Gary Ellis (Director, Gulf Archaeological Research Institute) stated that there was a need to provide additional information in the plan related to cultural resources. Specifically, he noted that much had been achieved at the preserve in researching and protecting cultural resources that needed to be recognized. He stated that staff should be commended on their sensitivity to the management needs of cultural resources. He discussed the unique cultural resource value of the preserve and noted that the list of known sites continues to grow with each additional survey.

Dixie Hollins (President, Hollinswood Citrus, Mining and Timber, Inc.) expressed his appreciation for having the opportunity to be involved as a past landowner of the property. He asked for an update on plans for managing lands adjacent to the Cross Florida Greenway. Staff explained that there was interest in expanding equestrian trails on preserve lands in the area that would connect to existing equestrian trails on the Greenway. Staff indicated that the concept of releasing a portion of the preserve to the Office of Greenways and Trails for the purposes of expanding equestrian facilities was not supported by CAMA and DRP field and District staff. It was clarified that current plans were to provide spur trails on the preserve, but for DRP to maintain management of the area. Any planned infrastructure to support equestrian use would be located on the Greenway property. Staff also discussed the need to carefully plan the design and layout of trails to protect wetland resources and avoid hydrological impacts. Mr. Hollins discussed his knowledge and personal history with use of the land in the area and offered support (both material and informational) to preserve staff. He also expressed thanks for being notified whenever prescribed burns were to be conducted. Mr. Hollins stated that he would like to see more opportunities to see the preserve for visitors that may not be physically able to hike or bike long distances, and suggested occasional vehicular tours. Mr. Laakkonen and

Mr. Edwards discussed options that have been provided in the past, including the use of vehicles during bird counts, hay rides and guided equestrian tours. Staff indicated they were open to considering other special events that would enhance public access for visitors with limited mobility. Staff also discussed the growth of non-traditional user groups, such as those involved with geocaching, and their use of the preserve. It was explained that staff closely monitor their use, advise participants on existing rules and regulations and provide limits so as not to disturb sensitive resources. Mr. Hollins closed by expressing his appreciation for the role the preserve plays in maintaining the historical knowledge of the land and its past uses (turpentining, timbering, cattle grazing, etc.).

Chris McKendree (West End Manager, Cross Florida Greenway) was pleased to see the plan support the concept of providing an equestrian trail linkage with the Greenway, and indicated OGT would work with the preserve to design a trail that was appropriate to the resource. He noted the positive working relationship between OGT and preserve staff and discussed the importance of coordinating resource management actions. He expressed a willingness to provide equipment and manpower support for conducting prescribed burns on the preserve and commended preserve staff on the effective balancing of recreation/public access with protection of natural resources.

John Kostelnick (President, Friends of Crystal River State Parks) complemented Mr. Laakkonen and the buffer preserve staff on the content of the plan. He suggested including parcel names on the Proposed Land Acquisitions Map and adding a Burn Zone Map to the plan. Mr. Mathews responded that there were too many parcels to add to the map and keep it legible. He also explained that the number of burn zones also made it difficult to create a single map for the plan. Mr. Kostelnick asked how parcels are prioritized and eventually acquired. Mr. Laakkonen discussed the importance of having parcels included in the Florida Springs Coastal Greenway project boundary, the state appraisal process and the need for willing sellers. Mr. Kostelnick asked if the advisory group could help advocate for additional funding and staffing to handle the resource demands of the preserve. Mr. Laakkonen explained how needs identified in the plan are used to pursue legislative funding. Mr. Robbins discussed current staffing levels at the preserve, the importance of legislative support and trends in state government related to the state workforce. Mr. Kostelnick was concerned about providing information in the plan that could help looters and pot hunters locate cultural resources. Mr. Laakkonen clarified that no map was being provided. Mr. Pearson added that information on cultural resources is part of the public record and individuals could acquire location information through the Florida Master Site File. Mr. Kostelnick asked what could be done to improve protection of cultural sites beyond law enforcement patrols. Mr. Ellis explained that most looting is reported by members of the general public. Mr. Robbins discussed the use of volunteers at the preserve to monitor cultural sites. Mr. Hollins asked if the state could provide housing for someone to live on the preserve for additional security. Mr. Pearson responded that the DRP has provided housing at a reduced cost for law enforcement officers on lands that they manage. Mr. McKendree added that OGT has a similar situation with a law enforcement officer on the Greenway. Mr. Kostelnick commented on the modest number of proposed recreation projects in the plan. Staff reviewed the planned projects, the time it takes to secure funding and permits for construction, and discussed the importance of balancing resource protection with public access.

Mr. McKendree asked for clarification of the DRP unit classification system. Mr. Robbins reviewed the different classifications and how they are used to guide management at different properties. Jim Krause discussed the concept of management zoning and the need to consider how levels of protection compare across land managing agency boundaries on adjacent lands. Mr. Pearson and Mr. Kinnison explained the concepts of protected zones and wilderness preserve designations in the DRP planning process.

Nancy Smith (Planner, City of Crystal River) stated that the City of Crystal River was currently revising their land development regulations and was proposing a modification to the preserve's Conservation District zoning to exclude the residential density component. She explained that Public/Semi-public zoning would remain for the area that includes the visitor center. Mr. Kinnison requested that the City changes be coordinated with the DRP Office of Park Planning.

Mr. Hollins recommended improved maps and signage for the Loop Trail. He also proposed additional spur trails into the surrounding hammock. He asked for clarification on plans for the borrow pit south of Powerline Road and wondered if bank fishing would be encouraged. Mr. Laakkonen explained that preliminary plans call for recontouring the shoreline to improve habitat and fishing. He added that Progress Energy has raised security concerns about encouraging vehicular access to the area in the past. Mr. Hollins offered to use his contacts to secure donations of heavy equipment for the project.

Jim Kraus (Project Leader, Chassahowitzka National Wildlife Refuge Complex) expressed interest in reinforcing interagency cooperation between CAMA, DRP and USFWS managed lands. He discussed the importance of providing education opportunities on public lands and asked if the St. Martins Marsh Aquatic Preserve also had a management plan. Mr. Laakkonen affirmed that the St. Martins Marsh and Big Bend Seagrass Aquatic Preserves had management plans but that they were scheduled to be updated during the upcoming year. Mr. Kraus cited the fact that the USFWS acquisition boundary overlaps the current boundary of the preserve as an example of the need to improve coordination between agencies.

Mr. Laakkonen (Aquatic Preserve Manager, St. Martin's Marsh Aquatic Preserve) acknowledged all those that contributed to the plan, and thanked CAMA central office staff for providing a format that significantly improved the preserve plan. Mr. Krause responded that the USFWS would be referring to the preserve plan as a model in the update of the refuge management plan. Mr. Laakkonen closed by thanking the advisory group members for their role as supportive partners of the preserve.

Crystal River Preserve State Park
Advisory Group List

Local Government Officials

The Honorable Ronald Kitchen Jr.,
Mayor
City of Crystal River
123 NW Highway 19
Crystal River, FL 34428
(352) 795-4216

Represented by:
Nancy H. Smith, Planner
City of Crystal River
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The Honorable Josh Wooten, Chair
Citrus County Board of County
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Gary Maidhof, Director
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Nick Robbins, Park Manager
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Keith Laakkonen, Aquatic Preserve
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Citizens Support Organization

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Friends of Crystal River State Parks
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Environmental Representative

Jim Bierly, President
Florida Native Plant Society
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Homosassa, FL 34446
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Cultural Resource Representative

Gary Ellis
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Appendix 5

Natural Communities Known to Occur on the Crystal River Preserve State Park and FNAI Ranking System

⁎Natural Communities Known to Occur on the Crystal River Preserve State Park and FNAI Ranking System

⁎ A definition of FNAI rankings follows this section

Basin Marsh G? S4? - (synonyms: prairie, freshwater marsh). Basin Marsh is characterized as an herbaceous or shrubby wetland situated in a relatively large and irregular shaped basin. Typical plants include common reed, panicum, cutgrass, southern watergrass, pennywort, Spanish needle, redroot, soft rush, American lotus, water primrose, arrowhead, coastal plain willow, saltbush, elderberry, spikerush, knotweed, buttonbush, and dog fennel. Typical animals include two-toed amphiuma, lesser siren, greater siren, cricket frog, green treefrog, bull frog, pig frog, leopard frog, alligator, eastern mud snake, green water snake, banded water snake, striped swamp snake, black swamp snake, great blue heron, great egret, snowy egret, little blue heron, tricolored heron, bald eagle, and northern harrier.

Basin Marshes usually develop in large solution depressions that were formerly shallow lakes. The lake bottom has slowly filled with sediments from the surrounding uplands and with peat derived from plants. Thus, the soils are usually acidic peats. The hydroperiod is generally around 200 days per year. Open areas of relatively permanent water within the marsh, with or without floating aquatic vegetation, are considered to be Marsh Lakes.

Fire maintains the open herbaceous community by restricting shrub invasion. The normal interval between fires is 1 to 10 years, with strictly herbaceous marshes burning about every 1 to 3 years, and those with substantial willow and buttonbush having gone 3 to 10 years without fire. Fires during drought periods will often burn the mucky peat and will convert the marsh into a Marsh Lake.

Basin Marshes are associated with and often grade into Wet Prairie or Lake communities. They may eventually succeed to Bog, if succession is not reversed by a muck fire. Many of the plants and animals occurring in Basin Marshes also occur in Floodplain Marsh, Slough, Swale and Depression Marsh. Large examples of the Depression Marsh, in fact, may be very difficult to distinguish from small examples of Basin Marsh.

Normal hydroperiods must be maintained, or Basin Marsh vegetation will change. Shortened hydroperiods will permit the invasion of mesophytic species, while longer hydroperiods will convert marsh into lake. Fire is also necessary to control hardwood encroachment. However, fires during droughts should be avoided to reduce the possibility of a muck fire. Many sites have been degraded by pollution or drained for agricultural uses.

Basin Swamp G4? S3 - (synonyms: gum swamp, bay, bayhead, swamp). Basin Swamp is generally characterized as a relatively large and irregularly shaped basin that is not associated with rivers, but is vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. Dominant plants include blackgum, cypress, and slash pine. Other typical plants include red maple, swamp redbay, sweetbay magnolia, loblolly bay, Virginia willow, fetterbush, laurel greenbrier, Spanish moss, wax myrtle, titi, sphagnum moss, and buttonbush. Typical animals include southern dusky salamander, cricket frog, little grass frog, chicken turtle, striped mud turtle, ringneck snake, scarlet kingsnake, crayfish snake, cottonmouth, wood duck, hawks, turkey, great horned owl, barred owl, pileated woodpecker, songbirds, gray squirrel, black bear, raccoon, mink, river otter, bobcat, and white-tailed deer.

Soils in Basin Swamps are generally acidic, nutrient poor peats, often overlying a clay lens or other impervious layer. The resulting perched water table may act as a reservoir releasing groundwater as adjacent upland water tables drop during drought periods. The typical hydroperiod is approximately 200-300 days. Basin Swamps are thought to have developed in oxbows of former rivers or in ancient coastal swales and lagoons that existed during higher sea levels.

Infrequent fire is essential for the maintenance of cypress dominated Basin Swamps. Blackgum and hardwood dominated Basin Swamps burn less often, while pine dominated Basin Swamps burn more frequently. Without fire, hardwood invasion and peat accumulation will eventually create a Bottomland

Forest or Bog. Typical fire intervals in Basin Swamps may be anywhere from 5 to 150 years. Cypress and pines are very tolerant of light surface fires, but muck fires burning into the peat can kill the trees, lower the ground surface, and transform a swamp into a pond or lake.

Small Basin Swamps may be difficult to distinguish from large Dome Swamps. Basin Swamps are often associated with and may grade into Wet Flatwoods, Hydric Hammock, or Bottomland Forest. The species composition of Basin Swamps frequently overlaps with Floodplain Swamp, Strand Swamp, and Baygall.

Like other wetland communities, normal hydroperiods must be maintained in Basin Swamps. If water levels must be artificially manipulated, somewhat deeper than normal water is not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods will permit invasion of mesophytic species and change the character of the understory or will allow a devastating fire to enter which would drastically alter the community. Occasional fires are necessary to maintain the cypress and pine components.

Basin Swamps are unsuitable for construction because of their extended hydroperiods and peaty soils. Most have been degraded by timber harvests, and many have been drained or polluted. Thus, very few pristine examples of Basin Swamp communities exist. Those that remain should be adequately protected and properly managed.

Dome Swamp G4? S3?- (synonyms: isolated wetland cypress dome, cypress pond, gum pond, bayhead, cypress gall, pine barrens pond). Dome Swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Pond cypress, swamp tupelo, and slash pine are common plants. Other typical plants include red maple, dahoon holly, swamp bay, sweetbay, loblolly bay, pond apple, Virginia willow, fetterbush, chain fern, netted chain fern, poison ivy, laurel greenbrier, Spanish moss, wild pine, royal fern, cinnamon fern, coastal plain willow, maidencane, orchids, wax myrtle, swamp titi, St. John's wort, sawgrass, lizard's tail, swamp primrose, water hyssop, redroot, sphagnum moss, floating heart, buttonbush, arum, and fire flag. Typical animals include flatwoods salamander, mole salamander, dwarf salamander, oak toad, southern cricket frog, pinewoods treefrog, little grass frog, narrowmouth toad, alligator, snapping turtle, striped mud turtle, mud turtle, eastern mud snake, cottonmouth, woodstork, wood duck, swallow-tailed kite, barred owl, pileated woodpecker, great-crested flycatcher, prothonotory warbler, and rusty blackbird.

Dome Swamps typically develop in sandy flatwoods and in karst areas where sand has slumped around or over a sinkhole, creating a conical depression. Soils are composed of peat, which becomes thickest toward the center of the dome, and are generally underlain with acidic sands and then limestone, although other subsoils may also occur. Some domes have a clay lens that helps retain water levels.

Dome Swamps often derive much of their water through runoff from surrounding uplands, but they may also be connected with underground channels, in which case subterranean flows would dominate the hydrological regime. Dome Swamps generally function as reservoirs that recharge the aquifer when adjacent water tables drop during drought periods. The normal hydroperiod for Dome Swamps is 200 to 300 days per year with water being deepest and remaining longest near the center of the dome.

Fire is essential for the maintenance of a cypress dome community. Without periodic fires, hardwood invasion and peat accumulation would convert the dome to Bottomland Forest or Bog. Dome Swamps dominated by bays are close to this transition. Fire frequency is greatest at the periphery of the dome and least in the interior where long hydroperiods and deep peat maintain high moisture levels for most of the year. The normal fire cycle might be as short as 3 to 5 years along the outer edge and as long as 100 to 150 years towards the center. The profile of a Dome Swamp (i.e., smaller trees at the periphery and largest trees near the center) is largely attributable to this fire regime. The shorter hydroperiods along the periphery permit fires to burn into the edge more often, occasionally killing the outer trees. Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill them, lower the ground surface, and transform a dome into a pond.

Dome Swamps may have a Depression Marsh or pond in their center, creating a doughnut appearance when viewed from above. Dome Swamps typically grade into Wet Prairie or Marl Prairie around the periphery, but they may also be bordered by bottomland Forest or Swale. The species composition of Dome Swamps frequently overlaps with Strand Swamp, Wet Flatwoods, Basin Swamp, Baygall, Floodplain Swamp, and Freshwater Tidal Swamp.

Normal hydroperiods must be maintained. Somewhat deeper than normal water levels are not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods will permit the invasion of mesophytic species, which will change the character of the understory and eventually allow hardwoods to replace cypress. Dome Swamps may also be degraded by pollution and the invasion of exotic plants.

Floodplain Forest G4 S3 - (synonyms: bottomland hardwoods, seasonally flooded basins or flats, oak-gumcypress, elm-ash-cottonwood, second bottom, levee forest, river terrace, river ridge). Floodplain Forests are hardwood forests that occur on drier soils at slight elevations within floodplains, such as on levees, ridges and terraces, and are usually flooded for a portion of the growing season. Floodplain Forests are largely restricted to the alluvial rivers of the panhandle. The dominant trees are generally mixed mesophytic hardwoods, such as overcup oak, water hickory, diamond-leaf oak and swamp chestnut oak. The understory may be open and parklike or dense and nearly impenetrable. Other typical plants include bluestem palmetto, willow oak, green ash, Florida elm, sweetgum, hackberry, water oak, American hornbeam, tulip poplar, coastal plain willow, black willow, eastern cottonwood, swamp cottonwood, river birch, red maple, silver maple, box elder, American sycamore, catalpa, sweetbay magnolia, hawthorn, swamp azalea, pink azalea, gulf sebastiana, lanceleaf greenbrier, poison ivy, peppervine, rattanvine, indigo bush, white grass, plume grass, redtop panicum, caric sedges, silverbells, crossvine, American wisteria and wood grass.

Floodplain Forests harbor a diverse array of animals including both temporary residents and permanent residents. Typical animals include marbled salamander, mole salamander, two-toed amphiuma, Alabama waterdog, Southern dusky salamander, two-lined salamander, three-lined salamander, dwarf salamander, slimy salamander, rusty mud salamander, sirens, southern toad, cricket frog, bird-voiced treefrog, gray treefrog, bullfrog, river frog, Southern leopard frog, alligator, river cooter, stinkpot, Southeastern five-lined skink, broadhead skink, mud snake, rainbow snake, redbelly watersnake, brown water snake, glossy crayfish snake, black swamp snake, cottonmouth, yellow-crowned night-heron, wood duck, Mississippi kite, swallowtail kite, red-shouldered hawk, woodcock, barred owl, chimney swift, hairy woodpecker, pileated woodpecker, Acadian flycatcher, Carolina wren, veery, white-eyed vireo, red-eyed vireo, parula warbler, prothonotary warbler, Swainson's warbler, hooded warbler, cardinal, towhee, opossum, southeastern shrew, short-tailed shrew, beaver, wood rats, rice rats, cotton mouse, golden mouse, bear, and raccoon.

Soils of Floodplain Forests are variable mixtures of sand, organics, and alluvials, which are often distinctly layered. Hydroperiod is the primary physical feature of Floodplain Forests, which are inundated by flood waters nearly every year for 2 to 50% of the growing season. The organic material accumulating on the floodplain forest floor is picked up during floods and redistributed in the floodplain or is washed downriver to provide a critical source of minerals and nutrients for downstream ecosystems, in particular estuarine systems. These floods also replenish soil minerals through deposition on the floodplain. Floodplain Forests usually do not have standing water in the dry season.

Floodplain Forests are often associated with and grade into Floodplain Swamp, Bottomland Forest, Baygall, or Slope Forest. The species composition is frequently similar to that of Hydric Hammock and Bottomland Forest communities.

The maintenance of natural hydrologic regimes is critical to the health of Floodplain Forests and to the downstream systems with which they are connected. Species composition and the functional relationships throughout a river system are negatively impacted by hydrological alterations such as artificial impoundments, river diversion projects, pesticide use, forest clearcutting, or intensive agriculture.

Floodplain Swamp G4 S4 - (synonyms: river swamp, bottomland hardwoods, seasonally flooded basins or flats, oak-gum-cypress, cypress-tupelo, slough, oxbow, back swamp). Floodplain Swamps occur on flooded soils along stream channels and in low spots and oxbows within river floodplains. Dominant trees are usually buttressed hydrophytic trees such as cypress and tupelo; the understory and ground cover are generally very sparse. Other typical plants include ogeechee tupelo, water tupelo, swamp titi, wax myrtle, dahoon holly, myrtle-leaved holly, large gallberry, possumhaw, hurrah-bush, white alder, lizard's tail, leather fern, royal fern, marsh fern, soft rush, laurel greenbrier, hazel alder, hawthorn, and swamp privet.

Floodplain Swamps harbor a diverse array of animals including both temporary and permanent residents. Typical animals include marbled salamander, mole salamander, amphiuma, Alabama waterdog, Southern dusky salamander, two-lined salamander, three-lined salamander, dwarf salamander, slimy salamander, rusty mud salamander, southern toad, cricket frog, bird-voiced treefrog, gray treefrog, bullfrog, river frog, Southern leopard frog, alligator, river cooter, stinkpot, Southeastern five-lined skink, broadhead skink, mud snake, rainbow snake, redbelly water snake, brown water snake, glossy crayfish snake, black swamp snake, cottonmouth, yellow-crowned night-heron, wood duck, swallowtail kite, Mississippi kite, red-shouldered hawk, woodcock, barred owl, chimney swift, hairy woodpecker, pileated woodpecker, Acadian flycatcher, Carolina wren, veery, white-eyed vireo, red-eyed vireo, parula warbler, prothonotary warbler, hooded warbler, Swainson's warbler, cardinal, towhee, opossum, southeastern shrew, short-tailed shrew, beaver, wood rat, rice rat, cotton mouse, golden mouse, bear, raccoon, and bobcat.

Soils of Floodplain Swamps are highly variable mixtures of sand, organic, and alluvial materials, although some sites, especially within sloughs or on smaller streams, may have considerable peat accumulation. Floodplain Swamps are flooded for most of the year, with sites along channels inundated by aerobic flowing water while those of sloughs and backswamps are flooded with anerobic water for extensive periods of time. Soils and hydroperiods determine species composition and community structure. Seasonal and often prolonged inundations restrict the growth of most shrubs and herbs, leaving most of the ground surface open or thinly mantled with leaf litter. Floods redistribute detrital accumulations to other portions of the floodplain or into the main river channel. This rich organic debris is essential to the functional integrity of downriver ecosystems such as estuaries. These swamps are usually too wet to support fire.

Floodplain Swamps are often associated with and grade into Floodplain Forest or Hydric hammock, and occasionally Baygall. The species composition of Floodplain Swamps is frequently similar to the Slough, Strand Swamp, Dome Swamp, and Basin Swamp communities.

Alteration of the hydroperiod by impoundments or river diversions and the disruption of floodplain communities by forestry or agriculture have devastating consequences to entire river and bay systems. Many plant and animal species, both onsite and down river, depend upon the presence and natural fluctuations of these swamps for survival and reproduction.

Freshwater Tidal Swamp G3 S3 - (synonyms: tidewater swamp, rivermouth swamp, sweetbay-swamp, tupelo-redbay). Freshwater Tidal Swamps occur on floodplains near the mouths of rivers just inland from mangroves or saltmarshes. They are swamp forests with well-developed trees inland and increasingly dwarfed trees towards the coast, often with an extensive mat of convoluted surface roots. The dominant trees are usually cabbage palm, black gum, bald cypress, southern magnolia, and red cedar. Other typical plants include water tupelo, pumpkin ash, swamp bay, white cedar, titi, wax myrtle, cocoplum, dahoon holly, myrtle-leaved holly, saltbush, asters, and leather fern. Typical animals include those with marine affinities such as olive nerites and fiddler crabs.

Freshwater Tidal Swamps occur near the mouths of rivers, often between anastomosing channels, on soils that are highly organic. These swamps are flooded by freshwater at least twice daily in response to tidal cycles. They are extremely vulnerable to hydrological modifications, saltwater intrusion, and clearcut logging.

Although this NC is widespread around the southeastern U.S., cabbage palm is a conspicuous element only in Florida. Because they are found only near river mouths, their distribution is inherently limited in Florida.

Hydric Hammock G4 S4 - (synonyms: wetland hardwood hammock, wet hammock). Hydric Hammock is characterized as a well developed hardwood and cabbage palm forest with a variable understory often dominated by palms and ferns. Typical plants include cabbage palm, diamond-leaf oak, red cedar, red maple, swamp bay, sweetbay, water oak, southern magnolia, wax myrtle, saw palmetto, bluestem palmetto, needle palm, poison ivy, dahoon holly, myrsine, hackberry, sweetgum, loblolly pine, Florida elm, swamp chestnut oak, American hornbeam, Walter viburnum, royal fern, peppervine, rattanvine, yellow jessamine, and Virginia creeper. Typical animals include green anole, flycatchers, warblers, and gray squirrel.

Hydric Hammock occurs on low, flat, wet sites where limestone may be near the surface and frequently outcrops. Soils are sands with considerable organic material that, although generally saturated, are inundated only for short periods following heavy rains. The normal hydroperiod is seldom over 60 days per year. Because of their generally saturated soils and the sparsity of herbaceous ground cover, Hydric Hammocks rarely burn.

Hydric Hammock occurs as patches in a variety of lowland situations, often in association with springs or karst seepage, and in extensive forests covering lowlands just inland of coastal communities. Hydric Hammock generally grades into Floodplain Swamp, Strand Swamp, Basin Swamp, Baygall, Wet Flatwoods, Coastal Berm, Maritime Hammock, Slope Forest, Upland Mixed Forest, or Upland Hardwood Forest. Hydric Hammock is often difficult to differentiate from Bottomland Forest, Prairie Hammock, and Floodplain Forest.

The normal hydrological regime must be maintained in Hydric Hammock. If the water table is lowered, Hydric Hammock will gradually change to mesic conditions. If the hammock is flooded, many trees will die and eventually be replaced by more hydrophytic species.

Mesic Flatwoods G? S4 - (synonyms: pine flatwoods, pine savannahs, pine barrens). Mesic Flatwoods are characterized as an open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs. Several variations of Mesic Flatwoods are recognized, the most common associations being longleaf pine - wiregrass - runner oak and slash pine - gallberry - saw palmetto. Other typical plants include: St. Johns-wort, dwarf huckleberry, fetterbush, dwarf wax myrtle, stagger bush, blueberry, gopher apple, tar flower, bog buttons, blackroot, false foxglove, white-topped aster, yellow-eyed grass, and cutthroat grass. Typical animals of Mesic Flatwoods include: oak toad, little grass frog, narrowmouth toad, black racer, red rat snake, southeastern kestrel, brown-headed nuthatch, pine warbler, Bachman's sparrow, cotton rat, cotton mouse, black bear, raccoon, gray fox, bobcat, and white-tailed deer.

Mesic Flatwoods occur on relatively flat, moderately to poorly drained terrain. The soils typically consist of 1-3 feet of acidic sands generally overlying an organic hardpan or clayey subsoil. The hardpan substantially reduces the percolation of water below and above its surface. During the rainy seasons, water frequently stands on the hardpan's surface and briefly inundates much of the flatwoods; while during the drier seasons, ground water is unobtainable for many plants whose roots fail to penetrate the hardpan. Thus, many plants are under the stress of water saturation during the wet seasons and under the stress of dehydration during the dry seasons.

Another important physical factor in Mesic Flatwoods is fire, which probably occurred every 1 to 8 years during pre-Columbian times. Nearly all plants and animals inhabiting this community are adapted to periodic fires; several species depend on fire for their continued existence. Without relatively frequent fires, Mesic Flatwoods succeed into hardwood-dominated forests whose closed canopy can essentially eliminate the ground cover herbs and shrubs. Additionally, the dense layer of litter that accumulates on unburned

sites can eliminate the reproduction of pines which require a mineral soil substrate for proper germination. Thus, the integrity of the Mesic Flatwoods community is dependent on periodic fires. However, fires that are too frequent or too hot would eliminate pine recruitment and eventually transform Mesic Flatwoods into Dry Prairie.

Mesic Flatwoods are closely associated with and often grade into Wet Flatwoods, Dry Prairie, or Scrubby Flatwoods. The differences between these communities are generally related to minor topographic changes. Wet Flatwoods occupy the lower wetter areas, while Scrubby Flatwoods occupy the higher drier areas.

Mesic Flatwoods are the most widespread biological community in Florida, occupying an estimated 30 to 50% of the state's uplands. However, very few undisturbed areas of Mesic Flatwoods exist because of habitat mismanagement and silvicultural, agricultural, or residential development. Mesic Flatwoods are often fairly resilient, and with proper management they can generally be restored.

Prairie Hammock G4 S3 -(synonyms: palm/oak hammock, hydric hammock). Prairie Hammock is characterized as a clump of tall cabbage palms and live oaks in the midst of prairie or marsh communities. These hammocks generally have a very open understory although saw palmetto typically rings the perimeter of these rounded clumps. Other typical plants include wax myrtle, water oak, stoppers, marlberry, pigeon plum, poison ivy, poison wood, orchids, and lidflowers. Typical animals include box turtle, southeastern five-lined skink, black racer, and several species of shrews and rodents.

Prairie Hammocks occur on slight rises in relatively flat terrain. Soils generally consist of sands overlying calcareous marls but may be a more complex association of marl, peat, and sand over limestone. Prairie Hammocks may flood during extreme high water, but they are seldom inundated for more than 10 to 40 days each year. Oak and palm dominated Prairie Hammocks on drier sites tolerate occasional light ground fires, but more diverse hammocks rarely burn. Sites with heavy shrub layers are liable to be severely damaged by a canopy fire.

Prairie Hammock may be associated with or grades into Hydric Hammock, Rockland Hammock, or Shell Mound. It is an advanced successional stage of Mesic Flatwoods, Dry Prairie, or Marl Prairie. Prairie Hammock also shares many species with Xeric Hammock and Maritime Hammock.

Prairie Hammock is largely restricted to peninsular Florida. Although Prairie Hammocks are widespread and fairly common, their generally small size increases their vulnerability to disturbances.

Sandhill G3 S2 - (synonyms: longleaf pine - turkey oak, longleaf pine - xerophytic oak, longleaf pine - deciduous oak, high pine). Sandhills are characterized as a forest of widely spaced pine trees with a sparseunderstory of deciduous oaks and a fairly dense ground cover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak, and wiregrass. Other typical plants include bluejack oak, sand post oak, sparkleberry, persimmon, winged sumac, pinewoods dropseed, Indian grass, wild buckwheat, queen's delight, yellow foxglove, bracken fern, runner oak, goats rue, partridge pea, milk pea, dollarweeds, wild indigo, gopher apple, and golden-aster. Typical animals include tiger salamander, barking treefrog, spadefoot toad, gopher frog, gopher tortoise, worm lizard, fence lizard, mole skink, indigo snake, coachwhip snake, pine snake, short-tailed snake, crowned snake, eastern diamondback rattlesnake, bobwhite, ground dove, red-headed woodpecker, rufous-sided towhee, fox squirrel and pocket gopher.

Sandhills occur on hilltops and slopes of gently rolling hills. Their soils are composed of deep, marine deposited, yellowish sands that are well-drained and relatively sterile. The easily leached soil nutrients are brought back to the surface by the burrowing habits of some sandhill animals. Sandhills are important aquifer recharge areas because the porous sands allow water to move rapidly through with little runoff and minimal evaporation. The deep sandy soils help create a xeric environment that is accentuated by the scattered overstory, which allows more sunlight to penetrate and warm the ground. The absence of a closed canopy also allows Sandhills to cool more rapidly at night and to retain less air moisture. Thus, temperature and humidity fluctuations are generally greater in Sandhills than in nearby closed canopy forests.

Fire is a dominant factor in the ecology of this community. Sandhills are a fire climax community, being dependent on frequent ground fires to reduce hardwood competition and to perpetuate pines and grasses. The natural fire frequency appears to be every 2 to 5 years. Without frequent fires, Sandhills may eventually succeed to Xeric Hammock. Unburned or cutover Sandhills may be dominated by turkey oak.

Sandhills are often associated with and grade into Scrub, Scrubby Flatwoods, Mesic Flatwoods, Upland Pine Forest, or Xeric Hammock. Sandhills were widespread throughout the Coastal Plain, but most have been degraded by timbering, overgrazing, plowing, fire exclusion, and other disturbances. Much of Florida's Sandhill communities have been converted to citrus groves, pastures, pine plantations, or residential and commercial developments. Thus, the importance of properly managing the remaining tracts is accentuated.

Scrub G2 S2 - (synonyms: sand pine scrub, Florida scrub, sand scrub, rosemary scrub, oak scrub). Scrub occurs in many forms, but is often characterized as a closed to open canopy forest of sand pines with dense clumps or vast thickets of scrub oaks and other shrubs dominating the understory. The ground cover is generally very sparse, being dominated by ground lichens or, rarely, herbs. Open patches of barren sand are common. Where the overstory of sand pines is widely scattered or absent altogether, the understory and barren sands are exposed to more intense sunlight. Typical plants include sand pine, sand live oak, myrtle oak, Chapman's oak, scrub oak, saw palmetto, rosemary, rusty lyonia, ground lichens, scrub hickory, scrub palmetto, hog plum, silk bay, beak rush, milk peas, and stagger bush. Typical animals include red widow spider, scrub wolf spider, oak toad, Florida scrub lizard, blue-tailed mole skink, sand skink, six-lined racerunner, coachwhip, ground dove, scrub jay, loggerhead shrike, yellow-rumped warbler, rufous-sided towhee, Florida mouse, and spotted skunk. Scrubs of the Lake Wales Ridge are notable for the large number of narrowly endemic plants and animals that occur in them.

Scrub occurs on sand ridges along former shorelines. Some of the sand ridges originated as wind deposited dunes, others as wave-washed sand bars. Some Scrub soils are composed of well-washed, deep sands that are brilliant white at the surface; some Scrubs occur on yellow sands. The loose sands drain rapidly, creating very xeric conditions for which the plants appear to have evolved several water conservation strategies.

Scrub is essentially a fire maintained community. Ground vegetation is extremely sparse and leaf fall is minimal, thus reducing the chance of frequent ground fires. As the sand pines mature, however, they retain most of their branches and build up large fuel supplies in their crowns. When a fire does occur, this fuel supply, in combination with the resinous needles and high stand density, ensures a hot, fast burning fire. Such fires allow for the regeneration of the Scrub community which might otherwise succeed to Xeric Hammock. The minerals in the vegetation are deposited on the bare sand as ashes, and the heat of the fire generally facilitates the release of pine seeds. As discerned from the life histories of the dominant plants, scrub probably burns catastrophically once every 20 to 80 years or longer.

Scrub is associated with and often grades into Sandhill, Scrubby Flatwoods, Coastal Strand, and Xeric Hammock. Some Xeric Hammocks are advanced successional stages of Scrub, making intermediate stages difficult to classify. Scrub occurs almost exclusively in Florida, although coastal scrubs extend into adjacent Alabama and Georgia.

Because Scrub occurs on high dry ground and is not an aesthetically pleasing habitat, at least to the uninitiated, this ecosystem and its many endangered and threatened species are rapidly being lost to development. Scrub is also readily damaged by off-road vehicle traffic or even foot traffic, which destroys the delicate ground cover and allows the loose sand to erode. Ground lichens may require 50 years or more to recover.

Scrubby Flatwoods G3 S3 - (synonyms: xeric flatwoods, dry flatwoods). Scrubby Flatwoods are characterized as an open canopy forest of widely scattered pine trees with a sparse shrubby understory and numerous areas of barren white sand. The vegetation is a combination of Scrub and Mesic Flatwoods species; Scrubby Flatwoods often occupy broad transitions or ecotones between these communities. Typical plants include longleaf pine, slash pine, sand live oak, Chapman's oak, myrtle oak, scrub oak, saw palmetto, staggerbush, wiregrass, dwarf blueberry, gopher apple, rusty lyonia, tarflower, golden-aster, lichens, silkbay, garberia, huckleberry, goldenrod, runner oak, pinweeds, and frostweed.

Scrubby Flatwoods generally occur intermingled with Mesic Flatwoods along slightly elevated relictual sandbars and dunes. The white sandy soil is several feet deep and drains rapidly. However, the water table is unlikely to be very deep. Scrubby Flatwoods normally do not flood even under extremely wet conditions. Temperatures and humidities of air and soil in Scrubby Flatwoods fluctuate substantially more than in most other communities because the scattered overstory, sparse understory, and barren sands of Scrubby Flatwoods do not ameliorate daily and seasonal changes very well.

Although the elevated, deeper sandy soils of scrubby flatwoods engender a drier environment than the surrounding mesic flatwoods, the general sparsity of ground vegetation and the greater proportion of relatively incombustible scrub-oak leaf litter reduces the frequency of naturally occurring fires. Only after a long absence of fire and during periods of drought does the leaf litter become sufficiently combustible and concentrated enough to support an ecological burn. Several species of plants in Scrubby Flatwoods are typical scrub plants which endure only when long intervals between fires occur. Thus, a periodicity of approximately 8 to 25 years between fires appears to be natural for this community.

Scrubby Flatwoods are associated with and often grade into Mesic Flatwoods, Scrub, Dry Prairie or Sandhills. This community is essentially a Mesic Flatwoods with a Scrub understory.

Tidal Marsh G4 S4 - (synonyms: saltmarsh, brackish marsh, coastal wetlands, coastal marshes, tidal wetlands). Marine and Estuarine Tidal Marshes are Floral Based Natural Communities generally characterized as expanses of grasses, rushes and sedges along coastlines of low wave-energy and river mouths. They are most abundant and most extensive in Florida north of the normal freeze line, being largely displaced by and interspersed among Tidal Swamps below this line. Black needlerush and smooth cordgrass are indicator species which usually form dense, uniform stands. The stands may be arranged in well-defined zones according to tide levels or may grade subtly over a broad area, with elevation as the primary determining factor. In the upper reaches of river mouths, where Estuarine Tidal Marsh begins to blend with Freshwater Tidal Swamp and Marsh, sawgrass may occur in dense stands. Sawgrass is the least salt tolerant of these Tidal Marsh species. Other typical plants include saltgrass, saltmeadow cordgrass (marsh hay), gulf cordgrass, soft rush and other rushes, salt myrtle, marsh elder, saltwort, sea oxeye, cattail, big cordgrass, bulrushes, seashore dropseed, seashore paspalum, horegrass, glassworts, seablight, seaside heliotrope, saltmarsh boltonia, and marsh fleabane. Typical animals include marsh snail, periwinkle, mud snail, spiders, fiddler crabs, marsh crab, green crab, isopods, amphipods, diamondback terrapin, saltmarsh snake, wading birds, waterfowl, osprey, rails, marsh wrens, seaside sparrows, muskrat and raccoon.

Fishes frequently found in this community include blacktip shark, lemon shark, bonnet-head shark, hammerhead shark, southern stingray, yellow spotted ray, tarpon, ladyfish, bonefish, menhaden, sardines, anchovy, catfish, needlefish, killifish, bluefish, blue runner, lookdown, permit, snapper, grunts, sheepshead, porgies, pinfish, seatrout, red drum, mullet, barracuda, blenny, goby, trigger fish, filefish, and puffers.

Tidal Marsh soils are generally very poorly drained muck or sandy clay loams with substantial organic components and often a high sulfur content. The elevation of Tidal Marshes range from just below sea level to slightly above sea level with vegetation occupying the intertidal and supratidal zones. The frequently high density of plant stems and roots effectively traps sediments derived from upland runoff or from littoral and storm currents. The decaying, dead marsh plants and the transported detritus which the living plants trap, accumulate to form peat deposits. Together, these accretion processes may build land.

Tidal Marsh plants live under conditions that would stress most plants. High salt content in the soil, poor soil aeration, frequent submersion and exposure, intense sunlight, and occasional fires make the Tidal Marsh community inhospitable to most plants and require a wide tolerance limit for its inhabitants. The landward extent of Tidal Marsh along the shoreline is directly related to the degree of bottom slope; the more gradual the slope the broader the community band. Typical zonation in this community includes smooth cordgrass in the deeper edges, grading to salt tolerant plants such as black needle rush that withstand less inundation.

Tidal fluctuation is the most important ecological factor in Tidal Marsh communities, cycling nutrients and allowing marine and estuarine fauna access to the marsh. This exchange helps to make Tidal Marsh one of the most biologically productive Natural Communities in the world. In fact, primary productivity in Tidal Marshes surpasses that of most intensive agricultural practices. The former operates at no cost because of free energy subsidies from tides, while the latter requires costly energy subsidies in the form of fuels, chemicals, and labor. A myriad of invertebrates and fish, including most of the commercially and recreationally important species such as shrimp, blue crab, oysters, sharks, grouper, snapper and mullet, also use Tidal Marshes throughout part or all of their life cycles.

Tidal Marshes are also extremely important because of their storm buffering capacity and their pollutant filtering actions. The dense roots and stems hold the unstabilized soils together, reducing the impact of storm wave surge. The plants, animals, and soils filter, absorb, and neutralize many pollutants before they can reach adjacent marine and estuarine communities. These factors make Tidal Marshes extremely valuable as a Natural Community.

Adverse impacts of urban development of Tidal Marshes include degradation of water quality, filling of marshes, increased erosion, and other alterations such as bulkheading and beach renourishment. The most attractive coastal areas for development activities frequently are the most ecologically fragile and are extremely vulnerable to development of any kind. Offshore pollution in the form of oil spills and various forms of litter jettisoned from shipping traffic also impact Tidal Marsh.

Tidal Swamps G3 S3 - (synonyms: mangrove forest, mangrove swamp, mangrove islands). Marine and Estuarine Tidal Swamps are Floral Based Natural Communities characterized as dense, low forests occurring along relatively flat, intertidal and supratidal shorelines of low wave energy along southern Florida. The dominant plants of Tidal Swamp Natural Communities are red mangrove, black mangrove, white mangrove and buttonwood. These four species occasionally occur in zones which are defined by varying water levels, with red mangrove occupying the lowest zone, black mangrove the intermediate zone, and white mangrove and buttonbush the highest zone. Other vascular plants associated with Tidal Swamps include salt grass, black needlerush, spike rush, glasswort, Gulf cordgrass, sea purslane, saltwort and sea oxeye. Typical animals of the Tidal Swamp include mangrove water snake, brown pelican, white ibis, osprey, bald eagle, and a variety of shorebirds, herons, egrets, and raccoon. Also included are sponges, oysters, marine worms, barnacles, mangrove tree crabs, fiddler crabs, mosquitos, and numerous other invertebrates. Fishes are likewise diverse in this community. Those most frequently occurring include black-tipped shark, lemon shark, nurse shark, bonnethead shark, rays, tarpon, ladyfish, bonefish, menhaden, sardines, lookdown, permit, snapper, sheepshead, porgies, pinfish, and mullet.

Several variations of Tidal Swamps are generally recognized. These include (1) overwash swamps found on islands which are frequently inundated by the tides; (2) narrow fringe swamps located along waterways; riverine swamps found in floodplains; (4) basin swamps growing in depressions slightly inland from the water; (5) hammock swamps, similar to basin swamps but growing at a slightly higher elevation; and (6) scrub swamps growing over hard substrates such as limestone marl.

Tidal Swamps occur in flat coastal areas. The soils are generally saturated with brackish water at all times, and at high tides these same soils are usually inundated with standing water. Mangroves grow on a wide variety of soils ranging from sands to muds. In older Tidal Swamps the sands and muds are usually covered by a layer of peat which has built up from detritus (decaying plant material).

The prop roots of red mangroves, the extensive pneumatophores (aerial roots) of black mangroves and the dense root mats of the white mangrove serve to entrap sediments and recycle nutrients from upland areas and from tidal import. This process serves in “island formation” and is a part of the successional process involved in land formation in south Florida. These root structures also provide substrate for the attachment of and shelter for numerous marine and estuarine organisms.

Temperature, salinity, tidal fluctuation, substrate and wave energy are five physical factors influencing the size and extent of Tidal Swamps. Mangroves require an annual average water temperature above 19oC (66oF) to survive. They do not tolerate temperatures below freezing or temperatures which fluctuate widely over the course of a year. Salt water is a key element in reducing competition from other plants and allowing mangroves to flourish. In addition, mangroves have adapted to the salt water environment by either excluding or excreting salt from plant tissues. Mangroves can survive in freshwater but are usually not found in large stands under such conditions in nature because they succumb to competition.

Tidal Swamps are closely associated with and often grade into Seagrass Beds, Unconsolidated Substrates, Tidal Marshes, Shell Mounds, Coastal Berms, Maritime Hammocks, and other coastal communities. Seagrass Beds and Unconsolidated Substrates are usually found in the subtidal regions surrounding Tidal Swamps. Tidal Marshes are often found along the inland boundary of the Tidal Swamps. Tropical hardwood species occupy Coastal Berm and Shell Mound communities which are often surrounded by mangroves. In Florida, Tidal Swamps occur along both coasts, buffered by barrier island formations. Tidal Swamps are most extensive from Cedar Key southward along the Gulf coast and from Ponce de Leon Inlet southward along the east coast. The most luxuriant growth occurs in the Ten-Thousand Island areas of southwest Florida.

The Marine and Estuarine Tidal Swamp communities are significant because they function as nursery grounds for most of the state’s commercially and recreationally important fish and shellfish. These Natural Communities are also the breeding grounds for substantial populations of wading birds, shorebirds, and other animals. The continuous shedding of mangrove leaves and other plant components produce as much as 80% of the total organic material available in the aquatic food web. Additionally, Tidal Swamps help protect other inland communities by absorbing the brunt of tropical storms and hurricanes.

Tidal Swamps have been and continue to be areas of environmental concern because many acres were destroyed through diking and flooding, ditching for mosquito control, and dredging and filling activities. Fortunately, specific legal protection for mangrove swamps was adopted by the state in 1985. Today, mangroves continue to face such problems as destruction from oil spills and changes in the quantity, quality and timing of the fresh water input as the adjacent uplands are developed or otherwise altered. Reducing estuarine salinity and flushing chemical pollutants from adjacent uplands have resulted in the destruction of some Tidal Swamp areas and the invasion of non-mangrove species.

The combination of these factors has resulted in a decrease in the number of acres of Tidal Swamps and a reduction in available nursery grounds and valuable habitat for native wildlife. Mangrove swamps can be replanted by man; however, long term monitoring has not been conducted to determine if restored sites function as the original community did. The best management practice is to prevent further destruction of existing Tidal Swamps and maintain a natural flow of fresh water into these areas.

Upland Hardwood Forest and Upland Mixed Forest G5 S3 and G4 S4 - (synonyms: mesic hammock, climax hardwoods, upland hardwoods, beech-magnolia climax, oak-magnolia climax, pine-oak-hickory association, southern mixed hardwoods, clay hills hammocks, Piedmont forest). Upland Hardwood Forests and Upland Mixed Forests are characterized as well-developed, closed-canopy forests of upland hardwoods on rolling hills. These communities have quite similar physical environments and share many species, including southern magnolia, pignut hickory, sweetgum, Florida maple, devil’s walking stick, American hornbeam, redbud, flowering dogwood, Carolina holly, American holly, eastern hophornbeam, spruce pine, loblolly pine, live oak, and swamp chestnut oak, among others. The primary difference between these communities is that Upland Mixed Forests generally lack shortleaf pine, American beech and other more northern species that typically occur in Upland Hardwood Forests. This is

predominantly a result of minor climatic differences, Upland Hardwood Forests being most common in northern panhandle Florida, and Upland Mixed Forests being most common in northern and central peninsula Florida. Other typical plants include gum bumelia, hackberry, persimmon, red cedar, red mulberry, wild olive, redbay, laurel cherry, black cherry, bluff oak, water oak, cabbage palm, basswood, winged elm, Florida elm, sparkleberry, Hercules' club, slippery elm, beautyberry, partridgeberry, sarsaparilla vine, greenbrier, trilliums, beech drops, passion flower, bedstraw, strawberry bush, silverbell, caric sedges, fringe tree, horse sugar, white oak, and blackgum. Typical animals include slimy salamander, Cope's gray treefrog, bronze frog, box turtle, eastern glass lizard, green anole, broadhead skink, ground skink, red-bellied snake, gray rat snake, rough green snake, coral snake, woodcock, barred owl, pileated woodpecker, shrews, eastern mole, gray
squirrel, wood rat, cotton mouse, gray fox, and white-tailed deer.

Upland Hardwood and Mixed Forests occur on rolling hills that often have limestone or phosphatic rock near the surface and occasionally as outcrops. Soils are generally sandy-clays or clayey sands with substantial organic and often calcareous components. The topography and clayey soils increase surface water runoff, although this is counterbalanced by the moisture retention properties of clays and by the often thick layer of leaf mulch which helps conserve soil moisture and create decidedly mesic conditions. Furthermore, the canopy is densely closed, except during winter in areas where deciduous trees predominate. Thus, air movement and light penetration are generally low, making the humidity high and relatively constant. Because of these conditions Upland Hardwood and Mixed Forests rarely burn.

Upland Hardwood Forests and Upland Mixed Forests are climax communities for their respective geographic locations. They are often associated with and grade into Upland Pine Forest, Slope Forest or Xeric Hammock. Occasionally, Upland Mixed Forests may also grade into Maritime Hammock or Prairie Hammock. During early stages of succession, Upland Hardwood and Mixed Forest may be difficult to distinguish from Upland Pine Forests that have not been burned for several years. Disturbed sites may require hundreds of years to reach full development with species compositions representative of climax conditions.

Silvicultural, agricultural, industrial, and residential developments have already eliminated the vast bulk of these communities. These activities are continuing at an accelerated pace in many areas, such that the few remnant mature examples are in urgent need of protection and proper management.

Wet Prairie G3 S2- (synonyms: sand marsh, savannah, coastal savannah, coastal prairie, pitcher plant prairie). Wet Prairie is characterized as a treeless plain with a sparse to dense ground cover of grasses and herbs, including wiregrass, toothache grass, maidencane, spikerush, and beakrush. Other typical plants include hatpins, marsh pinks, crownbeard, sundews, black-eyed susan, stargrass, white-top sedge, meadowbeauty, yellow-eyed grass, sneezeweed, sunflower, wax myrtle, pitcher plants, tickseed, St. John's wort, and panicums. Typical animals include cricket frog, chorus frog, little grass frog, black racer, yellow rat snake, cottonmouth, pygmy rattlesnake, northern harrier, caracara, southeastern kestrel, killdeer, long-billed marsh wren, red-winged blackbird, marsh rabbit, cotton rat, and cotton mouse.

Wet Prairie occurs on low, relatively flat, poorly drained terrain of the coastal plain. Soils typically consist of sands often with a substantial clay or organic component. The most important physical factors are hydrology and fire. Wet Prairie is seasonally inundated or saturated for 50 to 100 days each year and burns every 2 to 4 years. Wax myrtle quickly invades and will dominate Wet Prairies with longer fire intervals. In south Florida, melaleuca invasions can seriously impact Wet Prairies. Generally, Wet Prairies have a much shorter hydroperiod than other herbaceous wetlands and are subject to regular and prolonged desiccation during the dry season due to their flat topography.

Wet Prairie is closely associated with and often grades into Wet Flatwoods, Depression Marsh, Seepage Slope, Mesic Flatwoods, or Dry Prairie. Several other biological communities have somewhat similar species compositions or overlap in characteristics, including Swale, Seepage Slope, Basin Marsh, Floodplain Marsh, and Marl Prairie.

Wet Prairies were probably common throughout the Coastal Plain at one time. Few good quality, intact examples remain and some types, e.g. pitcher plant prairies, are becoming increasingly rarer. Wet Prairie is vulnerable to hydrological and fire regime alterations, overgrazing, and soil disturbances by off-road vehicles. Recovery from disturbances is often poor and slow.

FNAI GLOBAL RANK DEFINITIONS

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4 = Apparently secure globally (may be rare in parts of range)
G5 = Demonstrably secure globally
GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
GX = Believed to be extinct throughout range
GXC = Extirpated from the wild but still known from captivity or cultivation
G#? = Tentative rank (e.g., G2?)
G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3)
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
G#T#Q = Same as above, but validity as subspecies or variety is questioned.
GU = Due to lack of information, no rank or range can be assigned (e.g., GUT2).
G? = Not yet ranked (temporary)

FNAI STATE RANK DEFINITIONS

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range)
S5 = Demonstrably secure in Florida
SH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
SX = Believed to be extinct throughout range
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

Provided by FNAI for information only.

For official definitions and lists of protected species, consult the relevant federal agency.

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

LE Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
E(S/A) Endangered due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
T(S/A) Threatened due to similarity of appearance (see above).
PE Proposed for listing as Endangered species.
PT Proposed for listing as Threatened species.

C Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN Non-essential experimental population.
MC Not currently listed, but of management concern to USFWS.
N Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS

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

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.
LE Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
PS Proposed for listing as Species of Special Concern.
N Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: **http://doacs.state.fl.us/~pi/5b-40.htm#.0055**.
LE Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
LT Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
N Not currently listed, nor currently being considered for listing.

Appendix 6

Vertebrate Species Observed and Herbarium Inventory

Vertebrate Species Observed* at the Crystal River Preserve State Park

***** Observations may be from FNAI, preserve staff, other agencies, etc..

Mammals

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Southern short-tailed shrew	Blarina	carolinensis						
Domestic dog	Canis	familiaris						*
Coyote	Canis	latrans						*
Nine-banded armadillo	Dasypus	novemcinctus						*
Virginia opossum	Didelphis	virginiana						
Domestic cat	Felis	silvestris						*
Southeastern pocket gopher	Geomys	pinetis						
Southern flying squirrel	Glaucomys	volans						
River otter	Lontra	canadensis						
Bobcat	Lynx	rufus						
Florida long-tailed weasel	Mustela	frenata	peninsulae	G5T3	S3?			
Saltmarsh mink	Mustela	vison	halilimnetes	G5T3	S3			
Southeastern myotis	Myotis	austroriparius		G3	S3			
Wood rat	Neotoma	floridana						
Golden mouse	Ochrotomys	nuttalli						
White-tailed deer	Odocoileus	virginianus						
Marsh rice rat	Oryzomys	palustris						
Cotton mouse	Peromyscus	gossypinus						
Eastern pipistrelle	Pipistrellus	austroriparius						
Florida mouse	Podomys	floridanus		G3	S3	SSC		
Raccoon	Procyon	lotor						
Eastern mole	Scalopus	aquaticus						
Sherman's fox squirrel	Sciurus	niger		G5T2	S2	SSC		
Gray squirrel	Sciurus	carolinensis						
Cotton rat	Sigmodon	hispidus						
Southeastern shrew	Sorex	longirostris	longirostris					
Wild boar	Sus	scrofa						*
Marsh rabbit	Sylvilagus	palustris	paludicola					
Eastern cottontail	Sylvilagus	floridanus						
Brazilian free-tailed bat	Tadarida	brasiliensis						
Manatee	Trichechus	manatus	latirostris	G2	S2	E	E	
Atlantic bottle-nosed dolphin	Tursiops	truncatus						
Gray fox	Urocyon	cinereoargenteus						
Florida black bear	Ursus	americanus	floridanus	G5T2	S2	T		

Birds

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Cooper's Hawk	Accipiter	cooperii		G4	S3?			
Sharp-shinned hawk	Accipiter	striatus	velox					
Spotted sandpiper	Actitis	macularia						
Red-winged blackbird	Agelaius	phoeniceus						
Wood duck	Aix	sponsa						
Roseate spoonbill	Ajaia	ajaja		G5	S2S3	SSC		
Scott's seaside sparrow	Ammodramus	maritimus	peninsulae	G4T2	S2	SSC		
Sharp-tailed sparrow	Ammodramus	caudacutus						
Blue-winged teal	Anas	discors						
Green-winged teal	Anas	crecca	carolinensis					
Mallard	Anas	platyrhynchos	platyrhynchos					
Anhinga	Anhinga	anhinga						
Florida scrub jay	Aphelocoma	coerulescens	coerulescens	G3	S3	T	T	
Limpkin	Aramus	guarauna	pictus	G5	S3	SSC		
Ruby-throated hummingbird	Archilochus	colubris						
Great blue heron	Ardea	herodias						
Great egret	Ardea	alba		G5	S4			
American ruddy turnstone	Arenaria	interpres	morinella					
Ring-necked duck	Aythya	collaris						
Cedar waxwing	Bombycilla	cedrorum						
Great horned owl	Bubo	virginianus	virginianus					
Cattle egret	Bubulcus	ibis	ibis					*
Common goldeneye	Bucephala	clangula	americana					
Bufflehead	Bucephala	albeola						
Red-shouldered hawk	Buteo	lineatus	alleni					
Red-tailed hawk	Buteo	jamaicensis	umbrinus					
Green heron	Butorides	virescens						
Red knot	Calidris	canutus	rufa					
Sanderling	Calidris	alba						
Semipalmated sandpiper	Calidris	pusilla						
Western sandpiper	Calidris	mauri						
Dunlin	Calidris	alpina						
Chuck-will's-widow	Caprimulgus	carolinensis						
Northern cardinal	Cardinalis	cardinalis						
American goldfinch	Carduelis	tristis						
Muscovy duck	Carina	moschata						*
Turkey vulture	Cathartes	aura	septentrionalis					
Hermit thrush	Catharus	guttatus						

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Veery	Catharus	fuscescens						
Willet	Catoptrophorus	semipalmatus						
Belted kingfisher	Ceryle	alcyon						
Chimney swift	Chaetura	pelagica						
Semipalmated plover	Charadrius	semipalmatus						
Killdeer	Charadrius	vociferus	vociferus					
Wilson's plover	Charadrius	wilsonia	wilsonia					
Ross' goose	Chen	rossii						
Snow goose	Chen	caerulescens						
Common nighthawk	Chordeiles	minor	chapmani					
Eastern nighthawk	Chordeiles	minor	minor					
Northern harrier	Circus	cyaneus	hudsonius					
Sedge wren	Cistothorus	platensis						
Marian's marsh wren	Cistothorus	palustris	marianae	G5T3	S3?	SSC		
Yellow-billed cuckoo	Coccyzus	americanus	americanus					
Northern flicker	Colaptes	auratus	auratus					
Northern bobwhite	Colinus	virginianus	floridanus					
Rock dove	Columba	livia						*
Common ground-dove	Columbina	passerina	passerina					
Eastern wood-pewee	Contopus	virens						
Black vulture	Coragyps	atratus						
Fish crow	Corvus	ossifragus						
American crow	Corvus	brachyrhyncos	pascuus					
Blue jay	Cyanocitta	cristata						
Magnolia warbler	Dendroica	magnolia						
Blackpoll warbler	Dendroica	striata						
Palm warbler	Dendroica	palmarum						
Prairie warbler	Dendroica	discolor	paludicola	G5T3	S3			
Pine warbler	Dendroica	pinus	florida					
Yellow-throated warbler	Dendroica	dominica	dominica					
Yellow-rumped warbler	Dendroica	coronata						
Chestnut-sided warbler	Dendroica	pensylvanica						
Yellow warbler	Dendroica	petechia	aestiva					
Black-throated blue warbler	Dendroica	caerulescens						
Bobolink	Dolichonyx	oryzivorus						
Pileated woodpecker	Dryocopus	pileatus	pileatus					
Gray catbird	Dumetella	carolinensis						
Snowy egret	Egretta	thula		G5	S4	SSC		
Tricolored heron	Egretta	tricolor		G5	S4	SSC		
Little blue heron	Egretta	caerula		G5	S4	SSC		

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
American swallow-tailed kite	Elanoides	forficatus	forficatus					
White ibis	Eudocimus	albus		G5	S4	SSC		
Merlin	Falco	columbarius	columbarius	G5	SU			
Peregrine falcon	Falco	peregrinus	anatum	G4	S2	E	E	
Southeastern kestrel	Falco	sparverius	paulus	G5T3T4	S3?	T		
American kestrel	Falco	sparverius	sparverius					
Magnificent frigatebird	Fregata	magnificens		G5	S1			
American coot	Fulica	americana	americana					
Common snipe	Gallinago	gallinago						
Common moorhen	Gallinula	chloropus	cachinnans					
Common loon	Gavia	immer						
Common yellowthroat	Geothlypis	trichas						
Whooping crane	Grus	americana		G1	SXC	SSC	X	
Blue grosbeak	Guiraca	caerulea						
American oystercatcher	Haematopus	palliatus	palliatus	G5	S3	SSC		
Bald eagle	Haliaeetus	leucocephalus		G4	S3	T	T	
Worm-eating warbler	Helmitheros	vermivorus		G5	S1			
Barn swallow	Hirundo	rustica						
Wood thrush	Hylocichla	mustelina						
Yellow-breasted chat	Icteria	virens						
Mississippi kite	Ictinia	mississippiensis						
Least bittern	Ixobrychus	exilis	exilis	G5	S4			
Loggerhead shrike	Lanius	ludovicianus						
Laughing gull	Larus	atricilla						
Ring-billed gull	Larus	delawarensis						
Herring gull	Larus	argentatus						
Black rail	Laterallus	jamaicensis	jamaicensis	G4	S3?			
Long-billed dowitcher	Limnodromus	scolopaceus						
Hooded merganser	Lophodytes	cucullatus						
Red-headed woodpecker	Melanerpes	erythrocephalus	erythrocephalus					
Red-bellied woodpecker	Melanerpes	carolinus						
Wild turkey	Meleagris	gallopavo	osceola					
Swamp sparrow	Melospiza	georgiana						
Redbreasted merganser	Mergus	serrator						
Northern mockingbird	Mimus	polyglottos						
Black-and-white warbler	Mniotilta	varia						
Brown-headed cowbird	Molothrus	ater						
Wood stork	Mycteria	americana		G4	S2	E	E	
Great-crested flycatcher	Myiarchus	crinitus						
Yellow-crowned night heron	Nyctanassa	violacea		G5	S3?			

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Black-crowned night heron	Nycticorax	nycticorax	hoactli	G5	S3?			
Eastern screech-owl	Otus	asio	floridanus					
Osprey	Pandion	haliaetus	carolinensis	G5	S3S4			
Northern parula	Parula	americana						
Carolina chickadee	Parus	carolinensis						
Tufted titmouse	Parus	bicolor						
House sparrow	Passer	domesticus						*
Indigo bunting	Passerina	cyanea						
American white pelican	Pelecanus	erythrorhynchos						
Brown pelican	Pelecanus	occidentalis		G4	S3	SSC		
Double-crested cormorant	Phalacrocorax	auritus						
Rose-breasted grosbeak	Pheuticus	ludovicianus						
Hairy woodpecker	Picoides	villosus		G5	S3?			
Downy woodpecker	Picoides	pubescens						
Rufous-sided towhee	Pipilo	erythrophthalmus	alleni					
Summer tanager	Piranga	rubra						
Scarlet tanager	Piranga	olivacea						
Black-bellied plover	Pluvialis	squatarola						
Horned grebe	Podiceps	auritus	cornutus					
Pied-billed grebe	Podilymbus	podiceps						
Blue-gray gnatcatcher	Polioptila	caerulea						
Purple gallinule	Porphyrula	martinica						
Sora	Porzana	carolina						
Purple martin	Progne	subis						
Boat-tailed grackle	Quiscalus	major						
Common grackle	Quiscalus	quiscula						
Clapper rail	Rallus	longirostris	scotti	G5T3?	S3?			
American avocet	Recurvirostra	americana		G5	S1S2			
Ruby-crowned kinglet	Regulus	calendula						
Black skimmer	Rynchops	niger		G5	S3	SSC		
Eastern phoebe	Sayornis	phoebe						
American woodcock	Scolopax	minor						
Northern waterthrush	Seiurus	noveboracensis						
Louisiana waterthrush	Seiurus	motacilla		G5	S3			
Ovenbird	Seiurus	aurocapillus						
American redstart	Setophaga	ruticilla		G5	S3			
Eastern bluebird	Sialia	sialis	sialis					
Yellow-bellied sapsucker	Sphyrapicus	varius						
Northern rough-winged swallov	Stelgidopteryx	serripennis						
Least tern	Sterna	antillarum	antillarum	G4	S3	T		

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Forster's tern	Sterna	forsteri						
Sandwich tern	Sterna	sandvicensis		G5	S2			
Royal tern	Sterna	maxima		G5	S3			
Eurasian collared dove	Streptopelia	decaocto						*
Barred owl	Strix	varia	georgica					
Eastern meadowlark	Sturnella	magna	argutula					
European starling	Sturnus	vulgaris						*
Tree swallow	Tachycineta	bicolor						
Carolina wren	Thryothorus	ludovicianus	miamensis					
Brown thrasher	Toxostoma	rufum						
Lesser yellowlegs	Tringa	flavipes						
Solitary sandpiper	Tringa	solitaria						
Greater yellowlegs	Tringa	melanoleuca						
House wren	Troglodytes	aedon						
American robin	Turdus	migratorius	migratorius					
Southern robin	Turdus	migratorius	achrusterus					
Gray kingbird	Tyrannus	dominicensis						
Eastern kingbird	Tyrannus	tyrannus						
Blue-winged warbler	Vermivora	pinus						
Tennessee warbler	Vermivora	peregrina						
Orange-crowned warbler	Vermivora	celata						
Solitary vireo	Vireo	solitarius	solitarius					
White-eyed vireo	Vireo	griseus	griseus					
Yellow-throated vireo	Vireo	flavifrons						
Red-eyed vireo	Vireo	olivaceus						
Hooded warbler	Wilsonia	citrina						
Mourning dove	Zenaida	macroura	carolinensis					
White-crowned sparrow	Zonotrichia	leucophrys						

Reptiles and Amphibians

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Florida cricket frog	Acris	gryllus	dorsalis					
Florida cottonmouth	Agkistrodon	piscivorous	conanti					
American alligator	Alligator	mississippiensis		G5	S4	SSC	T(SA)	
Green anole	Anolis	carolinensis						
Brown anole	Anolis	sagrei						*
Florida softshell	Apalone	ferox						
Southern toad	Bufo	terrestris						
Oak toad	Bufo	quercicus						

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Atlantic green turtle	Chelonia	mydas		G3	S2	E	E	
Florida snapping turtle	Chelydra	serpentina	osceola					
Six-lined racerunner	Cnemidophorus	sexlineatus	sexlineatus					
Southern black racer	Coluber	constrictor	priapus					
Eastern diamondback rattlesna	Crotalus	adamanteus		G5	S3			
Florida chicken turtle	Deirochelys	reticularia	chrysea					
Southern ringneck snake	Diadophus	punctatus	punctatus					
Eastern indigo snake	Drymarchon	corais	couperi	G4T3	S3	T	T	
Corn snake	Elaphe	guttata	guttata					
Yellow rat snake	Elaphe	obsoleta	quadrivittata					
Greenhouse frog	Eleutherodactylus	planirostris						*
Southeastern five-lined skink	Eumeces	inexpectatus						
Broadheaded skink	Eumeces	laticeps						
Eastern narrowmouth toad	Gastrophryne	carolinensis						
Gopher tortoise	Gopherus	polyphemus		G3	S3	SSC		
Mediterranean gecko	Hemidactylus	turcicus						*
Pinewoods treefrog	Hyla	femoralis						
Squirrel treefrog	Hyla	squirella						
Green treefrog	Hyla	cinerea						
Striped mud turtle	Kinosternon	baurii						
Florida mud turtle	Kinosternon	subrubrum	steindachneri					
Scarlet kingsnake	Lampropeltis	triangulum	elapsoides					
Florida kingsnake	Lampropeltis	getulus	floridana					
Atlantic ridley	Lepidochelys	kempii		G1	S1	E	E	
Ornate diamondback terrapin	Malaclemys	terrapin	macrospilota					
Eastern coral snake	Micrurus	fulvius	fulvius					
Brown water snake	Nerodia	taxispilota						
Gulf salt marsh snake	Nerodia	clarkii	clarkii	G4T3	S3?			
Florida water snake	Nerodia	fasciata	pictiventris					
Rough green snake	Opheodrys	aestivus						
Eastern glass lizard	Ophisaurus	ventralis						
Florida chorus frog	Pseudacris	nigrita	verrucosa					
Little grass frog	Pseudacris	ocularis						
Southern spring peeper	Pseudacris	crucifer	bartramiana					
Southern leopard frog	Rana	sphenocephala						
Bullfrog	Rana	catesbeiana						
Eastern spadefoot toad	Scaphiopus	holbrookii	holbrookii					
Southern fence lizard	Sceloporus	undulatus	undulatus					
Florida scrub lizard	Sceloporus	woodi		G3	S3			

Common Name	Genus	Species	Subspecies	FNAI G	FNAI S	FWC	USFWS	EXOTIC
Ground skink	Scincella	lateralis						
Greater siren	Siren	lacertina						
Dusky pygmy rattlesnake	Sistrurus	miliarius	barbouri					
Common musk turtle	Sternotherus	odoratus						
Loggerhead musk turtle	Sternotherus	minor	minor					
Gulf coast box turtle	Terrapene	carolina	major					
Florida box turtle	Terrapene	carolina	bauri					
Eastern garter snake	Thamnophis	sirtalis	sirtalis					
Peninsula ribbon snake	Thamnophis	sauritus	sackenii					
Bluestripe garter snake	Thamnophis	sirtalis	similis					
Yellowbelly slider	Trachemys	scripta	scripta					

Herbarium Inventory for Crystal River Preserve State Park

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Acanthaceae	Dyschoriste	oblongifolia			Oblong twinflower	17-Jul-00
Acanthaceae	Ruellia	caroliniensis			Carolina wild petunia	17-Apr-00
Acanthaceae	Stenandrium	dulce			Sweet shaggytuft	17-Apr-00
Agavaceae	Yucca	filamentosa			Adam's needle	04-May-00
Aizoaceae	Sesuvium	portulacastrum			Seapurslane	22-Mar-01
Alismataceae	Sagittaria	graminea	var.	chapmanii	Chapman's arrowhead	06-Mar-01
Alismataceae	Sagittaria	lancifolia			Bulltongue arrowhead	24-May-01
Amaryllidaceae	Crinum	americanum			String-lily, seven-sisters	30-Jun-00
Amaryllidaceae	Zephyranthes	atamasca			Atamasco liy, rainlily	10-Mar-00
Anacardiaceae	Rhus	copallinum			Winged sumac	04-May-00
Anacardiaceae	Schinus	terebinthifolius			Brazilian pepper	17-Jan-01
Anacardiaceae	Toxicodendron	radicans			Poison ivy	17-Apr-00
Annonaceae	Asimina	pygmaea			Dwarf pawpaw	16-Jun-00
Annonaceae	Asimina	reticulata			Netted pawpaw	05-Mar-01
Apiaceae	Eryngium	aquaticum			Rattlesnakemaster	08-Aug-01
Apiaceae	Eryngium	baldwinii			Baldwin's eryngo	12-Jun-00
Apiaceae	Eryngium	yuccifolium			Rattlesnakemaster, button eryngo	06-Jun-00
Apiaceae	Hydrocotyle	umbellata			Marsh pennywort	22-Mar-01
Apiaceae	Oxypolis	filiformis	ssp.	filiformis	Water cowbane, water dropwort	31-Aug-00
Apiaceae	Ptilimnium	capillaceum			Mock bishopsweed	22-May-01
Aquifoliaceae	Ilex	cassine	var.	cassine	Dahoon holly	06-Oct-00
Aquifoliaceae	Ilex	glabra			Gallberry, inkberry	03-Nov-00
Aquifoliaceae	Ilex	vomitoria			Yaupon holly	06-Oct-00
Asclepiadaceae	Asclepias	incarnata			Swamp milkweed	08-Aug-00
Asclepiadaceae	Asclepias	lanceolata			Few-flower milkweed	12-May-00
Asclepiadaceae	Asclepias	longifolia			Longleaf milkweed	01-May-01
Asclepiadaceae	Asclepias	tomentosa			Velvetleaf milkweed	08-Aug-01
Asclepiadaceae	Asclepias	tuberosa			Butterfly milkweed, butterflyweed	06-Jul-00
Asteraceae	Acmella	oppositifolia	var.	repens	Creeping spotflower	19-Jul-00
Asteraceae	Ambrosia	artemisiifolia			Common ragweed	06-Oct-00
Asteraceae	Arnoglossum	floridanum			Florida Indian plantain	29-Jun-00
Asteraceae	Aster	carolinianus			Climbing aster	01-Nov-00
Asteraceae	Berlandiera	subacaulis			Florida greeneyes	13-Apr-00
Asteraceae	Bidens	alba			Spanish needles	19-Jul-00
Asteraceae	Bidens	mitis			Smallfruit beggarticks	28-Apr-00
Asteraceae	Borrichia	frutescens			Seaside oxeye daisy	09-May-00
Asteraceae	Carphephorus	corymbosus			Florida paintbrush	21-Jul-00

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Asteraceae	Carphephorus	odoratissimus			Vanillaleaf, vanilla plant	28-Sep-00
Asteraceae	Chrysopsis	subulata			Scrubland goldenaster	19-Jul-00
Asteraceae	Cirsium	nuttallii			Nuttall's thistle	29-May-01
Asteraceae	Conoclinium	coelestinum			Blue mistflower, ageratum	02-Jun-00
Asteraceae	Coreopsis	leavenworthii			Leavenworth's tickseed	06-Jun-00
Asteraceae	Elephantopus	elatus			Tall elephantsfoot	13-Sep-00
Asteraceae	Emilia	fosbergii			Florida tasselflower	07-Feb-00
Asteraceae	Erigeron	quercifolius			Oakleaf fleabane	21-Mar-01
Asteraceae	Erigeron	vernus			Early whitetop fleabane	20-Mar-01
Asteraceae	Eupatorium	capillifolium			Dogfennel	06-Oct-00
Asteraceae	Eupatorium	milkanoides			Semaphore thoroughwort	18-Sep-00
Asteraceae	Eupatorium	mohrii			Mohr's thoroughwort	07-Aug-00
Asteraceae	Eupatorium	rotundifolium			False hoarhound	29-Jun-00
Asteraceae	Euthamia	caroliniana			Flat-topped goldenrod, slender goldenrod	06-Oct-00
Asteraceae	Flaveria	linearis			Narrowleaf yellowtops	06-Jun-00
Asteraceae	Helenium	pinnatifidum			Southeastern sneezeweed	10-Apr-00
Asteraceae	Helianthus	radula			Rayless sunflower, stiff sunflower	19-Jul-00
Asteraceae	Hieracium	megacephalon			Coastalplain hawkweed	23-May-01
Asteraceae	Iva	frutescens			Marshelder, sumpweed	06-Oct-00
Asteraceae	Krigia	virginica			Dwarf dandelion	21-Mar-01
Asteraceae	Liatris	chapmanii			Chapman's gayfeather, Chapman's blazing star	06-Oct-00
Asteraceae	Liatris	graminifolia			Grassleaf gayfeather, grassleaf blazing star	31-Aug-00
Asteraceae	Lygodesmia	aphylla			Rose-rush	18-Apr-00
Asteraceae	Melanthera	nivea			Snow squarestem	22-May-01
Asteraceae	Mikania	scandens			Climbing hempvine	13-Sep-00
Asteraceae	Palafoxia	integrifolia			Coastalplain palafox	06-Oct-00
Asteraceae	Phoebanthus	grandiflorus			Florida false sunflower	06-Jul-00
Asteraceae	Pityopsis	graminifolia			Narrowleaf silkgrass	06-Oct-00
Asteraceae	Pluchea	foetida			Stinking camphorweed	31-Aug-00
Asteraceae	Pluchea	rosea			Rosy camphorweed	30-May-00
Asteraceae	Pterocaulon	pycnostachyum			Blackroot, rabbit tobacco	26-Apr-00
Asteraceae	Rudbeckia	hirta			Blackeyed Susan	12-May-00
Asteraceae	Silphium	asteriscus			Starry rosinweed	20-Jul-00
Asteraceae	Silphium	compositum			Kidneyleaf rosinweed	06-Jul-00
Asteraceae	Solidago	odora	var.	chapmanii	Chapman's goldenrod	04-Aug-00
Asteraceae	Sonchus	asper			Spiny sowthistle	25-Apr-01
Asteraceae	Verbesina	virginica			Frostweed, white crownbeard	06-Oct-00
Asteraceae	Vernonia	gigantea			Giant ironweed	30-Jun-00
Avicenniaceae	Avicenna	germinans			Black mangrove	12-Jul-01

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Bignoniaceae	Campsis	radicans			Trumpet creeper, trumpet vine	07-Jun-00
Boraginaceae	Heliotropium	curassavicum			Seaside heliotrope, salt heliotrope	17-Apr-00
Brassicaceae	Lepidium	virginicum			Virginia pepperweed	05-May-00
Brassicaceae	Raphanus	raphanistrum			Wild radish	05-May-00
Buddlejaceae	Polypremum	procumbens			Rustweed	01-May-01
Campanulaceae	Campanula	floridana			Florida bellflower	10-Apr-00
Campanulaceae	Lobelia	glandulosa			Glade lobelia	06-Oct-00
Campanulaceae	Triodanis	perfoliata			Venus's lookingglass	10-Apr-01
Caprifoliaceae	Lonicera	sempervirens			Coral honeysuckle	11-Apr-01
Caprifoliaceae	Sambucus	canadensis			Elderberry	27-Apr-01
Caprifoliaceae	Viburnum	obovatum			Walter's viburnum	19-Feb-01
Commelinaceae	Commelina	erecta			Whitemouth dayflower	25-May-01
Convolvulaceae	Dichondra	caroliniensis			Carolina ponysfoot	08-Mar-01
Convolvulaceae	Evolvulus	sericeus			Silver dwarf morningglory	06-Sep-00
Convolvulaceae	Ipomoea	pandurata			Man-of-the-earth	01-Jun-00
Convolvulaceae	Ipomoea	sagittata			Saltmarsh morningglory	30-May-00
Cornaceae	Cornus	foemina			Swamp dogwood	27-Apr-01
Cucurbitaceae	Melothria	pendula			Creeping cucumber	19-Jul-00
Cupressaceae	Juniperus	virginiana			Southern red cedar	27-Jun-00
Cyperaceae	Cladium	jamaicense			Sawgrass	30-May-00
Cyperaceae	Rhynchospora	colorata			Star-top rush, starrush whitetop	17-Apr-00
Ericaceae	Bejaria	racemosa			Tarflower	06-Jul-00
Ericaceae	Gaylussacia	dumosa			Dwarf huckleberry	26-Apr-00
Ericaceae	Gaylussacia	frondosa	var.	tomentosa	Blue huckleberry	08-Mar-01
Ericaceae	Lyonia	ferruginea			Rusty staggerbush	13-Apr-00
Ericaceae	Lyonia	fruticosa			Coastalplain staggerbush	21-Mar-01
Ericaceae	Lyonia	lucida			Fetterbush	02-Mar-01
Ericaceae	Vaccinium	arboreum			Sparkleberry	03-Apr-01
Ericaceae	Vaccinium	corymbosum			Highbush blueberry	21-Feb-01
Ericaceae	Vaccinium	myrsinites			Shiny blueberry	21-Feb-01
Ericaceae	Vaccinium	stamineum			Deerberry	30-Mar-01
Eriocaulaceae	Syngonanthus	flavidulus			Yellow hatpins	01-May-01
Euphorbiaceae	Cnidoscolus	stimulosus			Tread-softly	18-Apr-00
Euphorbiaceae	Croton	argyranthemus			Silver croton	01-May-01
Euphorbiaceae	Stillingia	sylvatica			Queensdelight	17-Apr-00
Fabaceae	Albizia	julibrissin			Mimosa, silktree	25-Apr-01
Fabaceae	Amorpha	fruticosa			Bastard indigo	25-Apr-01
Fabaceae	Centrosema	virginianum			Spurred butterfly pea	03-Jul-00
Fabaceae	Cercis	canadensis			Eastern redbud	14-Feb-01

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Fabaceae	Crotalaria	rotundifolia			Rabbitbells	01-May-00
Fabaceae	Crotalaria	spectabilis			Showy rattlebox	18-Sep-00
Fabaceae	Dalea	carnea	var.	carnea	Dalea	04-Aug-00
Fabaceae	Galactia	elliottii			Elliott's milkpea	04-Aug-00
Fabaceae	Indigofera	caroliniana			Wild indigo, Carolina indigo	19-Jul-00
Fabaceae	Indigofera	spicata			Trailing indigo	10-Apr-01
Fabaceae	Macroptilium	lathyroides			Wild bushbean	19-Jul-00
Fabaceae	Melilotus	albus			White sweetclover	16-Mar-01
Fabaceae	Mimosa	quadrivalvis	var.	angustata	Sensitive briar	26-Apr-00
Fabaceae	Rhynchosia	michauxii			Michaux's snoutbean	01-May-00
Fabaceae	Senna	obtusifolia			Sicklepod, coffeeweed	13-Sep-00
Fabaceae	Trifolium	campestre			Field clover	10-Apr-00
Fabaceae	Trifolium	repens			White clover	28-Apr-00
Fabaceae	Vicia	acutifolia			Fourleaf vetch	28-Apr-00
Fabaceae	Vigna	luteola			Hairypod cowpea	07-Sep-00
Gentianaceae	Eustoma	exaltatum			Seaside gentian	03-Jul-00
Gentianaceae	Sabatia	calycina			Coastal rosegentian	25-Apr-01
Gentianaceae	Sabatia	stellaris			Rose of Plymouth	26-Apr-00
Geraniaceae	Geranium	carolinianum			Cranesbill	10-Apr-01
Hydrophyllaceae	Hydrolea	corymbosa			Sky flower	12-Sep-00
Hypericaceae	Hypericum	brachyphyllum			Coastalplain St. John's-wort	27-Jun-00
Hypericaceae	Hypericum	cistifolium			Roundpod St. John's-wort	29-Jun-00
Hypericaceae	Hypericum	mutilum			Dwarf St. John's wort	29-May-01
Hypericaceae	Hypericum	tetrapetalum			Fourpetal St. John's wort	13-Apr-00
Hypoxidaceae	Hypoxis	juncea			Fringed yellow stargrass	24-Apr-00
Iridaceae	Iris	hexagona			Prairie iris	10-Apr-00
Iridaceae	Sisyrinchium	angustifolium			Narrowleaf blueeyed grass	08-Mar-01
Iridaceae	Sisyrinchium	rosulatum			Annual blueeyed grass	10-Apr-01
Iteaceae	Itea	virginica			Virginia willow, sweetspire	21-Mar-01
Lamiaceae	Hyptis	alata			Musky mint, clustered bushmint	08-Aug-01
Lamiaceae	Monarda	punctata			Horsemint, spotted beebalm	13-Sep-00
Lamiaceae	Physostegia	purpurea			Eastern false dragonhead	22-May-01
Lamiaceae	Piloblephis	rigida			Wild pennyroyal	05-Mar-01
Lamiaceae	Salvia	lyrata			Lyreleaf sage	18-Apr-00
Lamiaceae	Scutellaria	arenicola			Florida scrub skullcap	21-Jul-00
Lamiaceae	Teucrium	canadense			Wood sage	29-Jun-00
Lamiaceae	Trichostema	dichotomum			Forked bluecurls	06-Oct-00
Lauraceae	Cinnamomum	camphora			Camphor tree	03-Feb-00
Lentibulariaceae	Pinguicula	caerulea			Blueflower butterwort	06-Mar-01

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Lentibulariaceae	Pinguicula	lutea			Yellow butterwort	02-Mar-01
Lentibulariaceae	Pinguicula	pumila			Small butterwort	03-Feb-00
Lentibulariaceae	Utricularia	radiata			Little floating bladderwort	25-Apr-01
Liliaceae	Aletris	obovata			Southern colicroot	17-Apr-00
Linaceae	Linum	medium	var.	texanum	Stiff yellow flax	09-May-00
Loganiaceae	Gelsemium	sempervirens			Carolina jessamine	19-Feb-01
Malvaceae	Kosteletzkya	virginica			Virginia saltmarsh mallow	03-Jul-00
Melastomataceae	Rhexia	mariana			Pale meadow beauty	06-Jul-00
Myricaceae	Myrica	cerifera			Wax myrtle, southern bayberry	06-Oct-00
Oleaceae	Fraxinus	pennsylvanica			Green ash, pumpkin ash	03-May-00
Onagraceae	Gaura	angustifolia			Southern beeblossum	19-Jul-00
Onagraceae	Oenothera	laciniata			Cutleaf eveningprimrose	10-Apr-01
Ophioglossaceae	Botrychium	virginianum			Rattlesnake fern	02-May-00
Orchidaceae	Calopogon	tuberosus			Tuberous grasspink	22-May-01
Orchidaceae	Habenaria	floribunda			Toothpetal false reinorchid	29-Oct-04
Orchidaceae	Hexalectris	spicata			Crested coralroot	04-Jun-04
Orchidaceae	Spiranthes	vernalis			Spring ladiestresses	23-May-01
Osmundaceae	Osmunda	cinnamomea			Cinnamon fern	18-Apr-00
Oxalidaceae	Oxalis	corniculata			Common yellow woodsorrel	10-Apr-01
Passifloraceae	Passiflora	incarnata			Purple passionflower	07-Aug-00
Phytolaccaceae	Phytolacca	americana			American pokeweed	21-Jul-00
Plantaginaceae	Plantago	virginica			Southern plantain	21-Mar-01
Plumbaginaceae	Limonium	carolinianum			Carolina sealavendar	24-Jul-00
Poaceae	Cenchrus	gracillimus			Slender sandbur	10-Oct-04
Poaceae	Chasmanthium	nitidum			Shiny woodoats	24-May-01
Poaceae	Eustachys	glauca			Saltmarsh fingergrass	23-May-01
Poaceae	Muhlenbergia	capillaris	var.	capillaris	Hairgrass, muhly grass, hairawn muhly	10-Oct-00
Poaceae	Paspalum	notadum	var.	saurae	Bahiagrass	25-May-01
Poaceae	Sorghastrum	secundum			Lopsided Indiangrass	06-Oct-00
Polygalaceae	Polygala	balduinii			Baldwin's milkwort	02-Jun-00
Polygalaceae	Polygala	grandiflora			Showy milkwort	01-May-01
Polygalaceae	Polygala	lutea			Orange milkwort	24-Apr-00
Polygalaceae	Polygala	nana			Candyroot	24-Apr-00
Polygonaceae	Eriogonum	tomentosum			Wild buckwheat	07-Aug-00
Polypodiaceae	Phlebodium	aureum			Goldenfoot fern, golden polypody	29-Jun-00
Polypodiaceae	Pleopeltis	polypodioides	var.	michauxiana	Resurrection fern	29-Jun-00
Pontederiaceae	Pontederia	cordata			Pickerelweed	26-Apr-00
Primulaceae	Samolus	ebracteatus			Water pimpernel	28-Apr-00
Primulaceae	Samolus	valerandi			Pineland pimpernel	10-Apr-00

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Pteridaceae	Acrostichum	danaeifolium			Giant leather fern	03-Aug-00
Ranunculaceae	Clematis	baldwinii			Pine hyacinth	10-Apr-00
Rhamnaceae	Berchemia	scandens			Rattan vine, supplejack	17-Apr-00
Rosaceae	Photinia	pyrifolia			Red chokeberry	02-Mar-01
Rosaceae	Prunus	caroliniana			Carolina laurel cherry	07-Feb-00
Rosaceae	Rubus	argutus			Sawtooth blackberry	06-Mar-01
Rosaceae	Rubus	cuneifolius			Sand blackberry	26-Apr-00
Rubiaceae	Cephalanthus	occidentalis			Common buttonbush	24-May-00
Rubiaceae	Chiococca	alba			Snowberry, milkberry	17-Jan-01
Rubiaceae	Diodia	virginiana			Virginia buttonweed	19-Jul-00
Rubiaceae	Galium	tinctorium			Stiff marsh bedstraw	24-May-01
Rubiaceae	Hedyotis	procumbens			Innocence	13-Feb-01
Rubiaceae	Richardia	brasiliensis			Tropical Mexican clover	01-Jun-00
Rubiaceae	Spermacoce	assurgens			Woodland false buttonweed	24-May-01
Rutaceae	Zanthoxylum	clava-herculis			Hercules'-club, prickly ash	09-May-00
Rutaceae	Zanthoxylum	fagara			Wild lime	26-Jun-01
Salicaceae	Salix	caroliniana			Carolina willow, coastalplain willow	17-Apr-00
Sapotaceae	Sideroxylon	reclinatum	ssp.	reclinatum	Florida bully	01-May-01
Saururaceae	Saururus	cernuus			Lizard's tail	24-Apr-00
Schizaeaceae	Lygodium	japonicum			Japanese climbing fern	07-Feb-00
Scrophulariaceae	Agalinis	maritima			Saltmarsh false foxglove	03-Jul-00
Scrophulariaceae	Aureolaria	flava			Smooth yellow false foxglove	13-Sep-00
Scrophulariaceae	Aureolaria	pedicularia	var.	pectinata	Fernleaf yellow false foxglove	25-May-01
Scrophulariaceae	Bacopa	monnieri			Herb-of-grace	06-Jun-00
Scrophulariaceae	Buchnera	americana			American bluehearts	09-May-00
Scrophulariaceae	Linaria	canadensis			Blue toadflax	10-Apr-01
Scrophulariaceae	Lindernia	grandiflora			Savannah false pimpernel	10-Apr-00
Scrophulariaceae	Mecardonia	acuminata	ssp.	peninsularis	Axilflower	13-Apr-00
Solanaceae	Lycium	carolinianum			Christmasberry, Carolina desertthorn	17-Oct-00
Solanaceae	Physalis	arenicola			Cypresshead groundcherry	13-Apr-00
Solanaceae	Physalis	walteri			Walter's groundcherry	03-May-00
Solanaceae	Solanum	americanum			American black nightshade	16-Jun-00
Solanaceae	Solanum	carolinense	var.	floridanum	Florida horsenettle	17-Jul-00
Turneraceae	Piriqueta	caroliniana			Pitted stripesteed	03-Jul-00
Verbenaceae	Callicarpa	americana			American beautyberry	31-Aug-00
Verbenaceae	Glandularia	canadensis			Rose mock vervain	25-Mar-04
Verbenaceae	Lantana	camara			Lantana	10-Apr-01
Verbenaceae	Phyla	nodiflora			Fogfruit, capeweed	30-May-00
Verbenaceae	Verbena	brasiliensis			Brazilian vervain	03-Jul-00

Family	Genus	Species	Rank	InfraspecificName	Common Name	Collection Date
Violaceae	Viola	lanceolata			Bog white violet	21-Feb-01
Violaceae	Viola	palmata			Early blue violet	19-Feb-01
Violaceae	Viola	primulifolia			Primroseleaf violet	21-Mar-01
Violaceae	Viola	sororia			Common blue violet	19-Feb-01
Vitaceae	Ampelopsis	arborea			Peppervine	19-Jul-00
Vitaceae	Vitis	aestivalis			Summer grape	23-May-01
Vitaceae	Vitis	rotundifolia			Muscadine	06-Jul-00
Vitaceae	Vitis	shuttleworthii			Calloose grape	22-Mar-01
Xyridaceae	Xyris	caroliniana			Carolina yelloweyed grass	06-Jul-00

Appendix 7

Florida Natural Areas Inventory Managed Area Tracking Record

Florida Natural Areas Inventory

MANAGED AREA TRACKING RECORD FOR
Crystal River State Buffer Preserve

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
FREGMAGN*0016	FREGATA MAGNIFICENS	MAGNIFICENT FRIGATEBIRD	G5	S1	N	N	1997-SPRI	Mangrove islands.	Roosting site. 1997 Spring: 22 birds observed perched on old guano piles (S. Blitch).
EGRETHUL*0157	EGRETTA THULA	SNOWY EGRET	G5	S3	N	LS	1994-12-08	Coastal hammock and surrounding coastal marsh (Juncus, salt bush, and cedar) with associated tidal creeks and ponds. Extensive stand of dead Sabal palmetto likely a result of salt water impacts (G. Maidhoff).	1994-12-08: G. Maidhoff observed three adult birds foraging.
EUDOALBU*0142	EUDOCIMUS ALBUS	WHITE IBIS	G5	S4	N	LS	1995-11	Coastal residential development within St. Martin's Marsh Aquatic Preserve and Crystal River State Buffer Preserve.	1995-10 through 1995-11: 12-14 birds observed almost daily (PNDSMY02).
MYCTAMER*0114	MYCTERIA AMERICANA	WOOD STORK	G4	S2	LE	LE	1994-12-08	Coastal hammock and surrounding coastal marsh (Juncus, salt bush, and cedar) with associated tidal creeks and ponds. Extensive stand of dead Sabal palmetto likely a result of salt water impacts (G. Maidhoff).	1994-12-08: G. Maidhoff observed ca. 30 birds (both adults and immatures) feeding or perched on dead palms.
ELANFORF*0010	ELANOIDES FORFICATUS	SWALLOW-TAILED KITE	G5	S2	N	N	1995-SPRI	NO GENERAL DESCRIPTION GIVEN	1995 Spring: One pair nested in planted slash pine (S. Blitch).
HALILEUC*0022	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1991	NO GENERAL DESCRIPTION GIVEN	NEST: 1995: GONE; 1994: INACTIVE; 1993: INACTIVE; 1992: NO DATA; 1991: ACTIVE, PRODUCTIVITY UNKNOWN; 1990: ACTIVE, PRODUCED 0 YOUNG; 1989: NO DATA; 1973-1974, 1976-1980, 1982, 1984, 1988 ACTIVE; FLEDGED YOUNG 1977-1980, 1982, 1988; NO DATA 1975, 1981, 19
HALILEUC*0024	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1994	NO GENERAL DESCRIPTION GIVEN	NEST: 1995: GREAT HORNED OWL; 1994: PRODUCED 1 YOUNG; 1993: PRODUCED 1 YOUNG; 1992: NO DATA; 1991: ACTIVE, PRODUCED 0 YOUNG; 1990: PRODUCED 2 YOUNG; 1989: PRODUCED 1 YOUNG; 1973-1982, 1984-1985 ACTIVE; FLEDGED YOUNG 1979-1981, 1984-1985; NO DATA 1983, 19

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
HALILEUC*0026	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1983	NO GENERAL DESCRIPTION GIVEN	NEST: 1995-93: GONE; 1992-86: NO DATA; 1975, 1977-1983 ACTIVE; 1976, 1985 INACTIVE. NO FLEDGED YOUNG. NO DATA 1984.
HALILEUC*0436	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1989	NO GENERAL DESCRIPTION GIVEN	NEST: 1995: GONE; 1994: GONE; 1993: GONE; 1992: NO DATA; 1991: ACTIVITY UNKNOWN; 1990: NO DATA; 1989: ACTIVE, PRODUCTIVITY UNKNOWN; 1973-1974, 1980-1982, 1988 ACTIVE; 1975-1978 INACTIVE; USURPED BY OWL 1979. FLEDGED YOUNG 1980-1981, 1988; 1979, 1982 UNKN
HALILEUC*0437	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1982	NO GENERAL DESCRIPTION GIVEN	NEST; 1995-93: GONE; 1992-83: NO DATA; ONLY ACTIVITY 1982. TWO ADULTS SEEN CARRYING NESTING MATERIALS IN. PREVIOUSLY NO ACTIVITY; USURPED BY OWLS.
HALILEUC*0438	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1989	NO GENERAL DESCRIPTION GIVEN	NEST: 1995-93: GONE; 1992: NO DATA; 1991: ACTIVITY UNKNOWN; 1990: NO DATA; 1989: ACTIVE, PRODUCTIVITY UNKNOWN; 1974-1975, 1977-1978, 1982 ACTIVE; DESTROYED 1976, 1983 (FELL DOWN); USURPED BY OWL 1979-1980, 1984-1985; FLEDGED YOUNG 1974, UNKNOWN 1975-1976
HALILEUC*0445	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1989	NO GENERAL DESCRIPTION GIVEN	NEST: 1995-93: GONE; 1992-90: NO DATA; 1989: ACTIVE, PRODUCTIVITY UNKNOWN; 1988: PRODUCED 2 YOUNG.
HALILEUC*0904	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1995	NO GENERAL DESCRIPTION GIVEN	Nest; 1995: Produced 1 young; 1994: Produced 2 young; 1993: Produced 2 young; 1992: No data; 1991: Active, productivity unknown; 1990: Produced 1 young; 1989: Active, productivity unknown; 1988: Active, produced 0 young; 1987-77: No data; 1976: Gone; 197
HALILEUC*0907	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1995	NO GENERAL DESCRIPTION GIVEN	Nest; 1995: Produced 1 young; 1994: Produced 1 young; 1993: Active, produced 0 young.

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
HALILEUC*0911	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1995	NO GENERAL DESCRIPTION GIVEN	Nest; 1995: Produced 2 young; 1994: Produced 2 young.
HALILEUC*0912	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S3	LT	LT	1995	NO GENERAL DESCRIPTION GIVEN	Nest; 1995: Produced 1 young; 1994: Produced 2 young; 1993: Produced 2 young.
APHECOER*0043	APHELOCOMA COERULESCENS	FLORIDA SCRUB-JAY	G2	S2	LT	LT	1981-03-26	OAK ^SCRUB^	1981-03-26: 2 SCRUB JAYS
APHECOER*0486	APHELOCOMA COERULESCENS	FLORIDA SCRUB-JAY	G2	S2	LT	LT	1995-02-02	Scrub containing Quercus geminata, Q. myrtifolia, and Q. chapmanii.	1995-02-02: S. Blitch observed 3 adult jays (no leg bands).
CISTMARI*0001	CISTOTHORUS PALUSTRIS MARIANAE	MARIAN'S MARSH WREN	G5T3	S3	N	LS	1997-04-09	Tidal Marsh; Juncus and Juncus-Spartina marshes.	1997-04: several wrens singing in the salt marshes along Salt River and Game Creek; also observed in the salt marshes bordering the south side of Fort Island Trail (CR 44) (NeSmith, Jue, and Blanchard). 1980: Kale (1983) found wrens "numerous north of Ho
PODOFLOR*0071	PODOMYS FLORIDANUS	FLORIDA MOUSE	G3	S3	N	LS	1990-11-30	Scrubby Flatwoods	1990-11-30: D.J. Stevenson, GFC, captured and held 1 young.
GOPHPOLY*1048	GOPHERUS POLYPHEMUS	GOPHER TORTOISE	G3	S3	N	LS	1997-04-08	Planted slash pine; includes some relic sandhill planted with slash pine and turkey oak (NW1/4 of section 2 T18SR16E).	1997-04-08: One individual sighted on dirt road in NW1/4 section 1 T18SR16E (S. Blitch et al.). 1995-1997: S. Blitch made several sightings of tortoises at three different locations within element occurrence boundaries (see attached map).
DRYMCOUP*0069	DRYMARCHON CORAIS COUPERI	EASTERN INDIGO SNAKE	G4T3	S3	LT	LT	ZZ	NO GENERAL DESCRIPTION GIVEN	SPECIMEN SEEN HERE BY H.I. KOCHMAN (P. MOLER INTERVIEW, NO DATE).
DRYMCOUP*0450	DRYMARCHON CORAIS COUPERI	EASTERN INDIGO SNAKE	G4T3	S3	LT	LT	1996-XX-	Planted slash pine and pine flatwoods (T17SR16E sec. 35); oak hammock and pasture (T18SR16E Sec. 1) (S. Blitch); mature slash pine plantation (G. Maidhoff).	1995-1996: Individuals observed at four different locations by S. Blitch (no specific dates). 1995-02-21: One snake observed by Ms. Yulee Commander basking in fire trail (U95MAI02).
CROTADAM*0117	CROTALUS ADAMANTEUS	EASTERN DIAMONDBACK RATTLESNAKE	G4	S3	N	N	1994-10-15	Snakes have been observed in general vicinity in a variety of habitats from salt marsh to scrub.	1994-10-15: One DOR observed (U94MEN02). 1992-10-06: One DOR observed (U92MEN01). 1989-05-16: One DOR observed (U89MEN01). 1987-09-00: One snake observed while removing debris pile (U87MEN01).
CROTADAM*0270	CROTALUS ADAMANTEUS	EASTERN DIAMONDBACK RATTLESNAKE	G4	S3	N	N	1996	Planted pine.	1996: S. Blitch observed one individual once or twice near state buffer preserve's shop.

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
MARIMARS*0008	MARINE TIDAL MARSH	ZZ	G5	S4	N	N	1984-05-16	BROAD NEEDLERUSH FLATS BORDERED BY MANGROVES ON GULF SIDE AND HAMMOCK ISLANDS TO LANDWARD. [SEE ATTACHED PROFILE].	MARSH DOMINATED BY BLACK NEEDLERUSH (JUNCUS ROEMERIANUS) INTERMIXED WITH SALT GRASS (DISTICHLIS SPICATA) WHICH MAY ALSO GROW ALONE IN MEADOWS. CORDGRASS (SPARTINA ALTERNIFLORA) OCCURS ALONG TIDAL CREEKS. FREQUENTLY FLOODED SALT "PANNES" IN MARSH CONTAIN
MARIMARS*0009	MARINE TIDAL MARSH	ZZ	G5	S4	N	N	1983-08-23	MARSH ARCHIPELAGO WITH ALTERNATING SALT MARSH TIDAL CREEK, AND HYDRIC HAMMOCKS RELATED TO UNDER-LYING KARSTIC TOPOGRAPHY [SEE PROFILE ATTACHED).	DOMINANT SPECIES -- BLACK NEEDLERUSH (JUNCUS ROEMERI- ANUS) ASSOC. SPECIES: SPARTINA ALTERNIFLORA (ALONG TIDAL CREEKS).
MARIMARS*0010	MARINE TIDAL MARSH	ZZ	G5	S4	N	N	1984-06-13	E. EDGE OZELLO MARSH ARCHIPELAGO NEAR FORESTED UPLANDS.	EARLY STAGE OF MARSH FORMATION AS SEA LEVEL RISES: JUNCUS ROEMERIANUS GRADING INTO TYPHA SP. AND CLADIUM JAMAICENSE NEAR FRESHWATER EDGE OF UPLANDS.
MARISWAM*0017	MARINE TIDAL SWAMP	ZZ	G5	S4	N	N	1984-05-06	MANGROVE SWAMP ON SEAWARD SIDE OF MARSH ARCHIPELAGO. INNER PARTS OF MARSH ISLAND DOMINATED BY JUNCUS ROEMERIANUS WITH ISLANDS OF HAMMOCKS (SEE ATTACHED PROFILE).	MIXTURE OF RED (RHIZOPHORA MANGLE) AND BLACK (AVICENNIA GERMINANS) MANGROVES ON OUTER FRINGE OF OZELLO MARSH ARCHIPELAGO. LESSER SPECIES INCLUDE JUNCUS ROEMERIANUS, SPARTINA ALTERNIFLORA WITH RUPPIA MARITIMA AND BROWN ALGAE IN TIDAL CHANNELS.
HYDRHAMM*0013	HYDRIC HAMMOCK	ZZ	G4	S4	N	N	1983-08-23	MARSH ARCHIPELAGO WITH ALTERNATING SALT MARSH, TIDAL CREEK AND HYDRIC HAMMOCK RELATED TO UNDERLY-ING KARSTIC TOPOGRAPHY (SEE PROFILE ATTACHED TO MARG# 22 THIS QUAD).	HAMMOCK ISLANDS DOMINATED BY CABBAGE PALMS (SABAL PALMETTO) AND RED CEDAR (JUNIPERUS SILICICOLA) WITH INTERMINGLED LIVE OAK (QUERCUS VIRGINIANUS) AND SLASH PINES (PINUS ELLIOTTII). [SEE DESCRIPTION ATTACHED].

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
HYDRHAMM*0058	HYDRIC HAMMOCK	ZZ	G4	S4	N	N	1997-04-07	This hammock is deep in the woods. Crystal River marshes and swamps are its south and west border. The north and east edges are flatwoods and sandhills, also within the preserve.	1997-04-07: Completely canopied by mature trees reaching over 100 feet; understory and ground layer fairly open from lack of light; succession dominated by light gaps; enormous, clearly old growth. Hammock is interspersed with shallow running streams and
SCRUB****0043	SCRUB	ZZ	G2	S2	N	N	1981-03-26	OAK ^SCRUB^	OCCURRENCE AT SITE
SCRUB****0979	SCRUB	ZZ	G2	S2	N	N	1997-04-10	This EO stands on a sandy ridge south of the Withlacoochee River between Yankeetown and Inglis. Houses line the road on its north border and the east border. A rock mine and swamps occupy the land to the south. To the west it turns abruptly swampy and ru	1997-04-10: A typical coastal scrub of this region with all the normal tree species; also typical in that fire suppression threatens this with conversion to xeric hammock. It is interesting in its proximity to the river which allows numerous depressional
UPLAFORE*0050	UPLAND MIXED FOREST	ZZ	G4	S4	N	N	1997-04-09	Bordered on the south by Highway 490A, to the east by housing in Homosassa Springs. North and west borders are swamps leading to the Hall's River. Homosassa Springs State Park is south of EO and is a continuation of this natural community but also has ma	1997-04-09: Very diverse assemblage of canopy trees. This EO probably contains species common to upland mixed forests and hydric hammocks, but the way the communities intergrade it is impossible to distinguish between the two. There are areas of rock out
MARIHAMM*0205	MARITIME HAMMOCK	ZZ	G3	S2	N	N	1991-11-26	SMALL HAMMOCK ISOLATED ON A SMALL ISLAND. GRADES INTO A POOR QUALITY COASTAL BERM ON W SIDE.	DOMINATED BY JUNIPERUS SILICICOLA, SABAL PALMETTO, AND YUCCA SP.

Appendix 8

Scrub Management Plan

Scrub Restoration and Management Plan
AHR Property
Crystal River State Buffer Preserve
Office of Coastal and Aquatic Managed Areas
Florida Department of Environmental Protection

Tom M. Matthews
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The AHR property of the Crystal River State Buffer Preserve was acquired in December of 1998. This parcel consists of approximately 400 acres of scrub, scrubby flatwoods, freshwater marsh, and swamps. This document details the restoration methods and timeline intended for this parcel.

Location
The AHR Scrub is located in northwest Citrus County, just south and east of the Withlacoochee River. The property is bounded by River Road on the north, residential property to the east, the Withlacoochee River and private property to the west, and a mine and Buffer Preserve land to the south.

History
The primary historical land use of this property has been low-intensity timber harvest. There is also evidence of hunting use. Fire has not been applied to this area on a regular basis, and the last documented fire was a wildfire in 1978.

Management Goals
The primary goal of this restoration project is to improve the area for scrub jay (*Aphelocoma coerulescens*) habitat. There are currently no jays nesting on the property, and jay use appears to be limited to the northwest corner. The existing jays, estimated at no more than 2 family groups of ~5 birds each, are concentrating their nesting and feeding in the area on the north side of River Road. This area consists of long, linear lots with development concentrated on the north side on the Withlacoochee River. The undeveloped portions of these lots are primarily scrub and scrubby flatwoods. There is no obvious reason for the jays to use this area and not the AHR parcel as they both have comparable vegetation heights, although it has been speculated that the developed areas interspersed throughout the lots provide more open area for foraging.

Current Conditions

Soils:
Soils, and their associated NRCS natural community type are as follows:

- Myakka Fine Sand
  - South Florida Flatwoods
- Hallandale-rock outcrop complex; rarely flooded
  - Cabbage Palm Hammock
- Boca Fine Sand
  - Cabbage Palm Flatwoods
- Myakka; limestone substratum-eaugallie; limestone substratum complex
  - Cabbage Palm Flatwoods
- Boca Fine Sand; depressional
  - Freshwater Marshes and Ponds
- Broward Fine Sand
  - Cabbage Palm Hammock
- Pits
- Water

Natural Communities:
Natural communities observed on the site include scrubby flatwoods, scrub, depression/basin marsh, depression/basin swamp, and floodplain forest. All communities are relatively undisturbed and exhibit most characteristic flora. The scrub and scrubby flatwoods are overgrown and at or above the critical height for scrub jay habitat.

Listed Species

Florida Scrub Jay (*Aphelocoma coerulescens*)
Gopher Tortoises (*Gopherus polyphemus*)

Restoration Methods

Mechanical- Roller chop/tree cut using an empty roller chopper and Brown tree cutter, as well as manual removal of trees in S1 initially, followed by S2 the next year, then S3, then S4. Where possible, debris from mechanical treatments will be piled in order to create areas of open sand following fire.

Fire- 5- to 15-year interval, depending on recovery of scrub, weather conditions, scrub jay nesting. Initial burns will be conducted within a year of mechanical prep. No more than one zone will be burned in a single season. Fires will be scheduled between January and April.

Timber- no significant timber resources

Roads- existing roads will be maintained as firebreaks and for access

Timeline

Initial mechanical treatment on zone S1 is scheduled for late winter/early spring 2001. This zone will be burned once mechanical treatment is complete and as soon as weather conditions permit. Zone S2 will receive mechanical treatment in fall/winter 2001 and fire treatment in early 2002. Zones S3 and S4 will follow in 2002/2003 and 2003/2004 respectively. This schedule may be modified depending on recovery in previously treated zones, weather conditions, and staff/equipment/funding availability.

Monitoring

Scrub Jay surveys: annual nesting surveys (weekly during nesting season once nesting is established), banding, periodic visits.
Avifaunal point counts: quarterly
Herp Arrays
Photopoints for each zone.
Vegetation: height, density, species-area curves.
Small mammals: trapping transects.
Gopher tortoise burrow surveys.

Outreach and Partnering

In order to maximize the effectiveness of our management, adjacent landowners will need to be involved in the management of their scrub. We have already reached an agreement with Citrus County in which we are able to manage the scrub vegetation on the right-of-way on River Road. We will also be conducting guided trips to the area and we will have a presentation on scrub management for local landowners. Related to this, we are investigating the potential for grants and agreements that would allow for management of scrub on adjacent private lands.

Figure 1: CRSBP Location Map
Figure 2: AHR Scrub Location Map
Figure 3: AHR Scrub Zones and Roads
Figure 4: Natural Communities
Figure 5: Soils
Figure 6: Regional Conservation Areas

Figure 1: Location of the Crystal River State Buffer Preserve

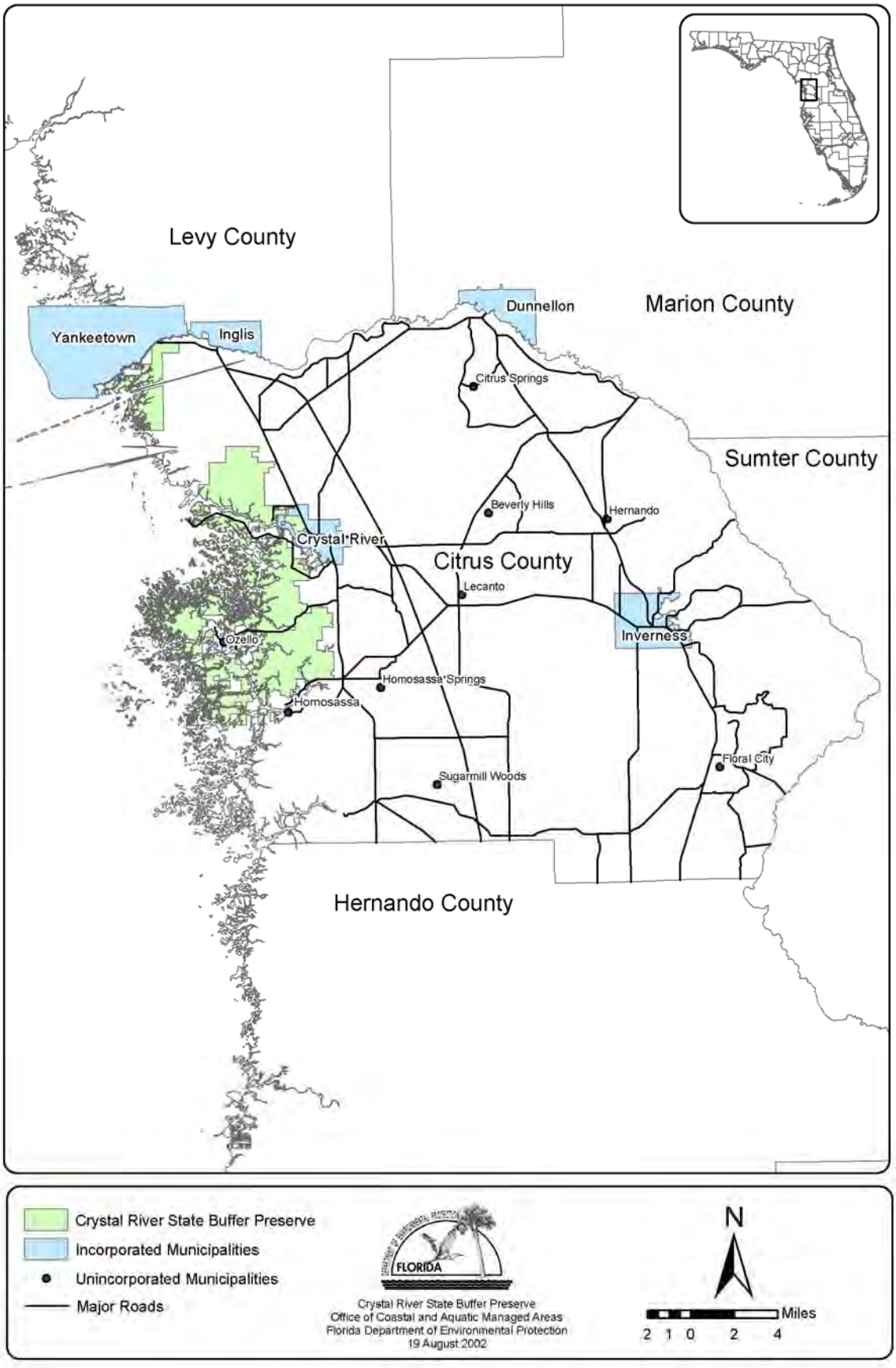


Figure 2: Location of the AHR Scrub

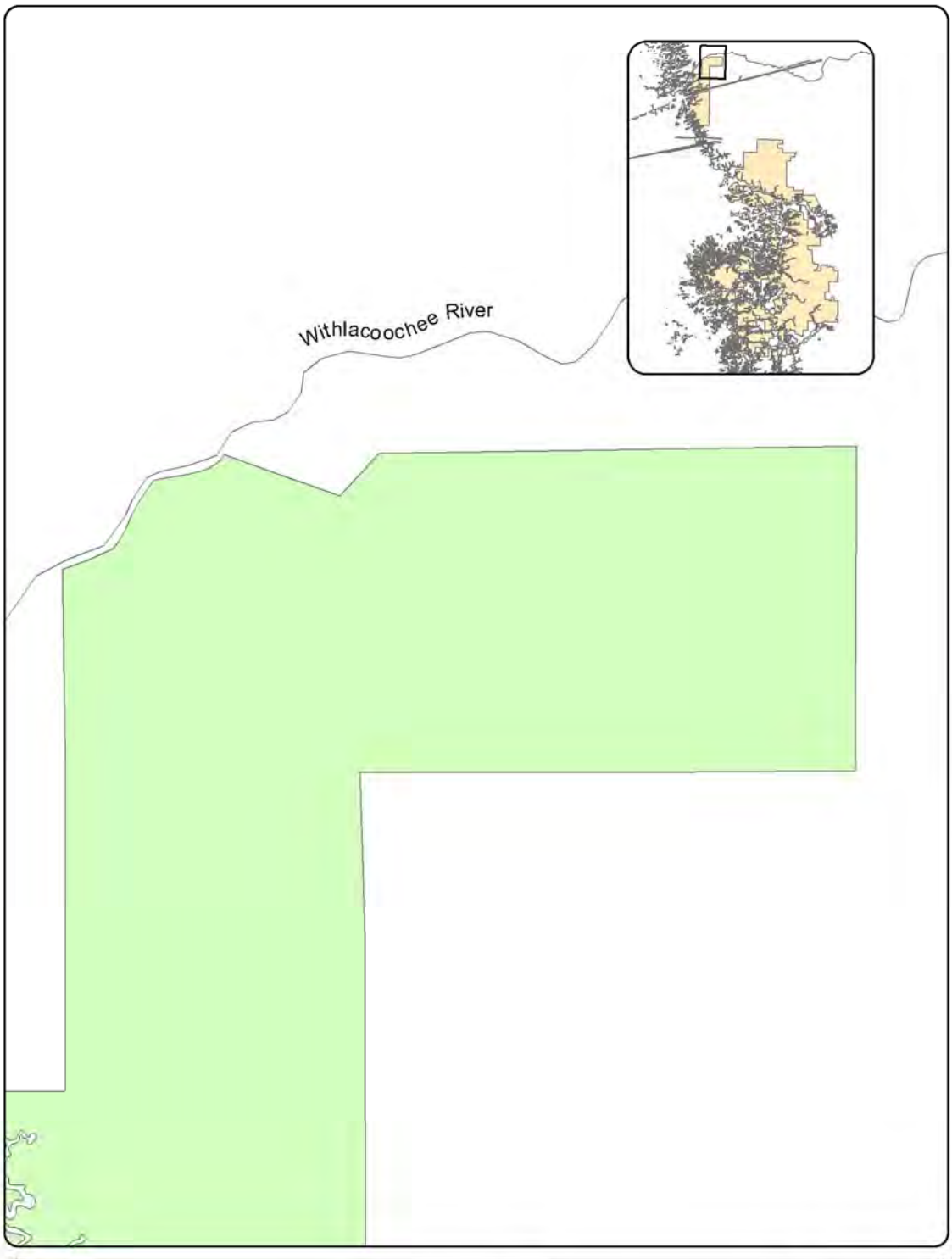
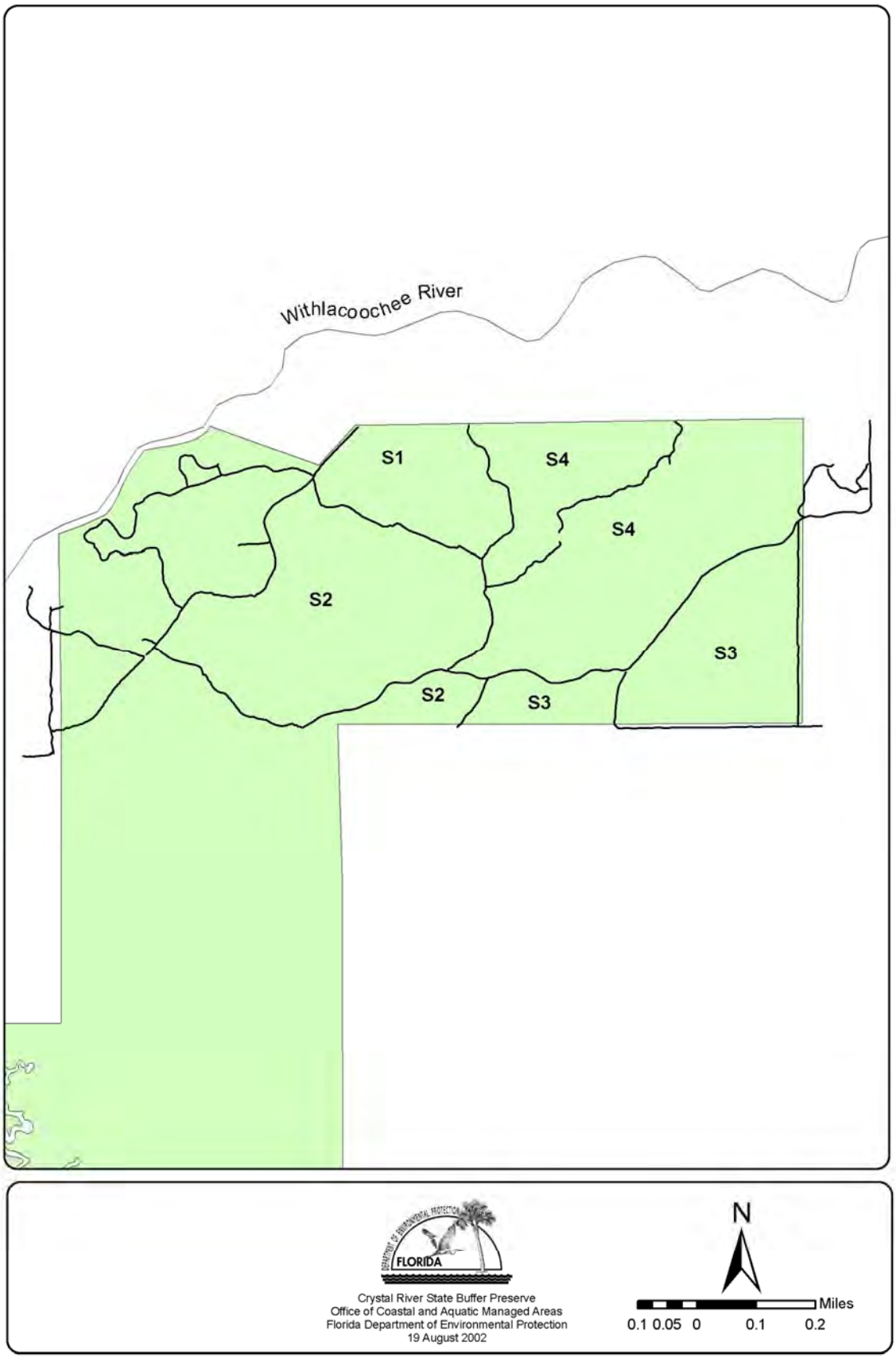


Figure 3: Roads and Zones



Crystal River State Buffer Preserve
Office of Coastal and Aquatic Managed Areas
Florida Department of Environmental Protection
19 August 2002

Figure 4: FNAI Natural Communities

Figure 5: Specific Soils

Crystal River State Buffer Preserve
Office of Coastal and Aquatic Managed Areas
Florida Department of Environmental Protection
19 August 2002

N

0.1 0.05 0 0.1 0.2 Miles

Appendix 9

Timber Management Assessment for the Crystal River Preserve State Park

TIMBER MANAGEMENT ASSESSMENT

CRYSTAL RIVER STATE BUFFER PRESERVE

PREPARED BY
BUTCH MALLETT
SENIOR FORESTER, OTHER STATE LANDS REGION 3
DIVISION OF FORESTRY
August 19, 2002

PURPOSE

This document is intended to fulfill the timber assessment requirement for Crystal River State Buffer Preserve (CRSBP) as required by Section 1. Section 253.036, Florida Statutes. The goal of this *Timber Assessment* is to evaluate the potential and feasibility of managing timber resources for conservation and revenue generation purposes.

BACKGROUND

The property that encompasses the Crystal River State Buffer Preserve has been acquired in stages. The first purchase was from the Dixie Hollins family. Other acquisitions included the Williams tract just south of Hollinswood and the Sterchi property that is accessed from U. S. Highway 19 between Crystal River and Homosassa.

All of the upland ecosystems have been degraded by the absence of natural fire regimes. As a result species such as saw palmettos (*Serenoa repens*), cabbage/sabal palms (*Sabal palmetto*), laurel oaks *(Quercus laurifolia),* water oaks *(Q. nigra),* turkey oaks *(Q. laevis),* and sweet gum *(Liquidambar styraciflua)* have proliferated.

GOALS AND OBJECTIVES

Crystal River State Buffer Preserve was established to protect sensitive coastal estuarine and marsh habitats from adverse effects of development. The primary management objective for CRSBP is to restore where necessary and maintain healthy flatwoods ecosystems to serve as buffers for these wetlands.

Large tracts of protected land with diverse habitat types provide the opportunity to manage for a wide variety of native plant and animal species. Crystal River State Buffer Preserve has a variety of ecotypes from oak scrubs to freshwater tidal marshes and tidal marshes. It is situated between a known isolated population of Florida black bears (*Ursus americanus floridanus*) to the south and large blocks of prime bear habitat to the north.

The Preserve is also on the fringe of a corridor that would connect two populations of the endangered Red-cockaded woodpecker (*Picoides borealis*). These birds thrive in healthy flatwoods ecosystems that contain open stands of pine timber with low understory vegetation maintained by fire.

Other unique and disappearing animal species rely on healthy pine stands for their survival. Included in this group are the gopher tortoise (*Gopherus polyphemus*), Sherman's fox squirrel (*Sciurus niger*), and eastern indigo snake (*Drymarchon corais*) to name a few. Measures implemented to insure healthy, flatwoods ecosystems will help promote the continued existence of these and other important species.

TIMBER MANAGEMENT

GENERAL TIMBER MANAGEMENT GUIDELINES

To better understand timber management methods, knowledge of a few silvicultural terms is useful. The cross sectional area (in square feet) of an individual tree measured four and one-half feet above the ground is its Basal Area. Basal Area per acre (BA) is the sum of the Basal Area of every tree within a stand divided the number of acres in the stand. It is used as a measure of a timber stand's tree stocking and density. The diameter of an individual tree taken at this height is referred to as its diameter breast height or DBH. This measurement is used in calculating the Basal Area and combined with height can determine volume of each tree.

Fully stocked pine stands have enough trees per acre of a size large enough to utilize the growing space without causing over-crowding. Pine stands with 70 to 100 square feet of Basal Area per acre (BA) are considered fully stocked. It requires more, smaller diameter trees than it does larger diameter trees to equal one square foot of basal area. (For example: It takes 357 evenly spaced, six-inch diameter breast height trees per acre to equal 70 sq. ft. BA. Whereas, only 89 twelve-inch DBH trees per acre equal the same 70 sq. ft. BA.)

Basal Area can be roughly correlated to crown coverage and therefore needle-cast. About 40 to 60 sq. ft. BA of pine trees should provide sufficient needles to carry prescribed fire and adequate sunlight for native grasses to be maintained.

In natural, pine dominated forest systems trees die because they become old and less able to withstand insect and disease attack. Bark beetles invade a weakened tree then multiply and kill some of its neighbors. This creates holes in the canopy of various sizes that allow full sunlight to reach the forest floor. Lightning strikes and windstorms do the same thing. In addition, lightning caused fires burn away leaf litter and expose bare mineral soil. The bare soil and canopy openings permit large numbers of sun-loving pine seedlings to become established and grow straight and tall.

Pine seedlings become established in these holes at very high densities. It is not uncommon to have ten to twenty thousand seedlings per acre in scattered openings. Recurrent wildfires and competition for sunlight, moisture, and nutrients favor the strongest, fastest growing pine saplings. The rest die off continually over the life of a stand of trees until the trees mature and another opening is created that replaces the survivors with young seedlings again. The result is an uneven aged stand where each group of trees created by a canopy opening is about the same age. However, the stand as

a whole is a mosaic of clusters that have different ages and densities. The ultimate goal of ecologically based timber management is to mimic these natural processes and still be able to harvest trees that are destined to die anyway. The challenge is to capture the value of the timber while minimizing the impact on the system as a whole.

Thinning type harvests in pine stands help maintain the health and vigor of the stand by removing weak, diseased and deformed trees. Enough co-dominant trees are removed during thinning to insure crown retention and continued growth in the remaining trees. To create uneven aged pine stands, group selection openings are cut during thinning activities. These openings allow young trees to become established by seed falling from nearby trees or by planting seedlings. Since pine seedlings require direct sunlight to grow, all trees within the opening must be removed. However, openings can be as small as one-half acre. For natural regeneration, the minimum width of the openings is about two to three chains. To prevent saplings growing in these openings from becoming barriers to RCW flight patterns, group selections should not exceed five acres in size.

Early photographs and historical accounts describe Florida flatwoods as much more of a "grassland" or "savanna" with a large pine overstory than occurs today. Dried grasses support frequent (every one to three years), low intensity lightning started fires. Fire burned accumulated leaf litter and exposed bare mineral soil. This bare ground combined with the light shading of emerging grasses was ideal for the germination and survival of seed and seedling Longleaf pine (*Pinus palustris*) (LLP). Longleaf seedlings were more tolerant of short-term recurring fire than seedling North Florida Slash Pine (*Pinus elliottii*) (NFSP). As a result, while Slash was probably always a component in the mesic flatwoods, it is likely that Longleaf pine occupied most of the higher ground. Slash pines were more prevalent where standing water or very moist conditions kept fires to a less frequent schedule.

Slash Pine Plantations - Slash pine grows fast and produces a dependable seed crop. It is easy to grow in nurseries and transplants well. As far as the timber grower is concerned, the only major drawback to the species is its regeneration's susceptibility to being killed by fire. However, since effective wildfire suppression began in Florida in the 1920's, NFSP has been the species of pine planted to replace cutover stands of Longleaf.

On CRSBP Slash pine popularity has come at a price. Elimination of natural fire to preserve the young, planted NFSP has allowed hardwood species, sabal palms, and saw palmettos to invade former LLP grasslands. Once these species became established, they shaded out native grasses that normally carried fire across the landscape. Without fire, leaf litter and shade build. Fire dependent, sun-loving plants (along with the animal species that rely on them) are lost from the ecosystem.

To restore and maintain a healthy fire dependent flatwoods ecosystem, it is desirable to reestablish a more fire tolerant species in the stands of planted Slash pine. Longleaf pine can be re-introduced to the system without completely removing all of the more mature existing pine trees that some wildlife depend upon. Stand conversion/regeneration

openings can total as much as one-quarter to one-third of a plantation's acreage. Maintaining at least a medium density of Slash pines assures enough needle cast to help carry essential prescribed fires. Thinning the remnant trees to 40 to 60 sq. ft. BA while cutting the openings eliminates the need to revisit these stands for 10 to 20 years. By that time, the planted Longleaf will have become sapling-sized and they will need thinning.

Natural Pine Stands - Natural stands that lack regeneration should have regeneration encouraged more slowly. In these stands, combined acres of all openings cut during each thinning is kept to no more than five to ten percent of the total stand acreage. Since each stand only gets thinned every ten-plus years, over-harvesting of old-growth trees is avoided and a steady supply of young trees is ensured. In other words, suppose ten percent of the stand was cut as a regeneration opening every ten years. After six ten-year cutting cycles at least 40 % of a stand would have 60+ year-old trees and 60% would range from seedlings to 50 year-old trees. If only five percent was harvested as openings every ten years, six cycles would yield a stand with **70%** 60+ year-old trees and 30% seedling to 50 years old.

Planting activities, group selection openings, palmetto control measures, and natural regeneration in thin stands will produce young trees of various sizes. A well stocked stand of young pine trees will usually require the removal of weak, diseased, and some over crowded trees beginning by the age of 15 to 20 years. By this time, the crowns have grown together and ground cover begins to get shaded out. Harvesting a portion of the timber maintains healthy pine growth and provides sunlight to the forest floor. Trees removed in the thinning process can be sold to generate revenue to be used in other land management projects. Likely markets for early thinnings from pine stands currently include pulpwood, fence posts and landscape mulch.

Due to shading effects, trees grown in tight spacing produce fewer and smaller lower limbs. The shedding of the lower limbs makes them more desirable for fence posts and later, more valuable products. Planting at least 400 seedlings per acre also helps insure the marketability of the pine trees and increases future management options.

The need for second and later thinnings will depend on how low the BA was taken in the first thin and successive growth rate. If the BA is reduced to 50 to 70 sq. ft. in the first cut, another harvest will probably be needed in ten to fifteen years. Trees removed from the second and succeeding operations produce ever more valuable products and therefore more money. Current market conditions have some second thinning products worth at least five times as much as the original wood that was cut. Third thinning trees can be worth twice as much as the second thin. All of this revenue can be generated and still have a stand of pine trees and a healthy ecosystem.

NOTE: ALL TIMBER MANAGEMENT ACTIVITIES MUST COMPLY WITH THE CURRENT VERSION OF THE SILVICULTURE BEST MANAGEMENT PRACTICES MANUAL (BMP'S) FOR PUBLIC LANDS AND OUTSTANDING FLORIDA WATERS (OFW).

EXISTING TIMBER RESOURCES

Prior to acquisition by the state, the upland portion of the Hollins Tract was intensively managed for timber and cattle production. Past timber harvesting and naval stores activity is still evident throughout the area. Most of the suitable ground was clearcut of a majority of the native pines, site-prepared and replanted with North Florida Slash Pine in the early 1970's. Primarily, trees left standing were too small, crooked, or deformed to be useful as sawtimber. Although, small pockets of native Slash and Longleaf pines still remain especially in or around wet areas and hammock lands.

A portion of the planted NFSP pine plantation acreage received a fifth-row thinning at least ten years ago. These stands average 60 to 80 sq. ft. BA. Some salt marsh islands, were bedded and planted at the same time as the original planting. These stands are chlorotic and declining. Neither the Williams nor the Sterchi properties appear to have received any timber management activities in over 50 years.

Recommendations:

Hollins Tract-

Plantation Pine Stands – (Approximately 389 acres)

Unthinned >100 sq. ft. BA – To open the canopy and maintain tree vigor, remove every third row and cut suppressed, deformed and diseased trees in "leave rows" to reach 50 - 60 sq. ft. BA. Group selection openings, as previously described, should be cut on higher ground to allow re-introduction of Longleaf pine into the ecosystem. If conditions permit and access can be arranged, plantations situated on salt marsh islands should be cut while thinning nearby stands. These trees are declining and will ultimately die out over the next few years if not harvested. In their weakened condition they could easily become hosts for an infestation of pine bark beetles. Similar attacks have proven devastating to otherwise healthy stands of trees in recent years.

Previously Thinned <100 sq. ft. BA – Thin to 50 – 60 sq. ft. BA and create stand conversion group selection openings and plant containerized LLP seedlings as previously described.

Natural Pine Stands – (Approximately 413 acres of Mesic Flatwoods)

Thin to 50 - 60 sq. ft. BA where needed to maintain healthy Slash pine stands. Leave 10 to 20 more sq. ft. BA of Longleaf than Slash. Small openings should be made in NFSP plantations adjacent to mature LLP to encourage natural regeneration. Most of these native pine areas are not large enough or have enough volume to allow commercial timber harvest on their own. Therefore, they should be thinned in conjunction with nearby plantation operations. A nice stand

of Longleaf in H25 near the Slash pine plantation known as the Turkey Farm does not need any harvest at the present time. Prescribed burning and possibly roller-drum chopping may be needed to control the understory vegetation (especially saw palmetto). If the palmettos are to be chopped, some pine trees may have to be removed to facilitate the operation.

Sterchi Tract-

Although this area covers many acres, only a small percentage is suitable for pine timber production. (Approximately 125 acres total - 113 acres of Mesic Flatwoods and 12 acres of Sandhill) A very dense stand of mixed age Longleaf pine occurs just inside the entrance off of U.S. Highway 19. This stand needs to be thinned to approximately 40 to 60 sq. ft. BA. Removing some of the trees in this fashion will facilitate safe prescribed burning and promote good growth in the remaining trees.

A portion of the sandhill community has a dense mid and overstory of turkey oaks (*Quercus leavis*) and blue-jack oaks (*Quercus incana*) which hinder longleaf pine regeneration and shade out native ground cover plants. While always a component of this ecosystem, their numbers have increased dramatically with the exclusion of growing season fires. These trees can be reduced to more reasonable numbers through the application of herbicides or with springtime prescribed burning.

Williams Tract-

There is a nice strand of mature Longleaf pine adjacent to U.S. Highway 19 and the new trailhead. (Approximately 48 acres of Mesic Flatwoods) However due to fire exclusion, hardwood species and sabal palms have completely dominated the understory. The dense shade from the hardwoods and resultant absence of pine regeneration means that there are no young pine trees to replace the old-growth pines when they die. If the managers decide to try to maintain Longleaf pine in this stand, the hardwoods and palms will have to be controlled.

Hardwood control can be achieved in several ways. Herbicides can be applied on the drier sites where most of the Longleaf occurs. Another way to kill unwanted hardwoods is to use a chainsaw to girdle each tree. Although, this will create an unsightly (and dangerous) stand of dead standing trees. The stand could also be heavily thinned by a push-pile-burn operation. But this method would be expensive and difficult to do next to the highway and shopping mall. A more visually appealing approach would be to harvest most of the hardwood timber if a market can be found. Scattered, individual trees can be marked to prevent cutting so as to maintain some diversity of species within the stand. Any necessary thinning of pine timber could be accomplished in conjunction with the hardwood harvest. The ability of Longleaf pine to regenerate itself is evidenced by the numerous seedlings currently found next to the strand of pines. This portion of

this area had the overstory opened and the soil disturbed when a kiosk and parking area lot was built recently.

Soils and Productivity –

The U. S. Department of Agriculture Natural Resource Conservation Service (NRCS) publishes soil series profiles and productivity tables. The following is a summary of the most prevalent soils and an estimate of timber production capabilities for each tract.

Hollins and Williams Tracts – Boca-Broward-Red Level soil association predominates here. Site index for natural Slash pine is 70 and Longleaf where present is 60. Therefore, 400 to 600 seedlings per acre established in regeneration openings could be expected to produce between 15 and 20 cords per acre in their first 20 years. Approximately 8 cords per acre would be available for removal in the first thinning. At current market prices that would yield revenues of about $100 to $150 per acre. Of course, while the seedlings were growing and encroaching on each other so were their larger neighbors in the stand. As a result to alleviate stress from over crowding and maintain healthy ecosystems, each thinning operation removes some of the more valuable trees at the same time. So proceeds from timber sales often reach $300 to $400 per acre while maintaining intact timber stands.

Sterchi – Basinger-Eau Gallie-Myakka association of flatwoods soils is found in this region. However, timber productivity is similar to the other tracts.

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, risk of collateral ecological damage, 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.

REGENERATION

NATURAL (USED IN AREAS WITH MATURE, CONE BEARING TREES)

Control saw palmettos, sabal palms, hardwoods, and dense understory vegetation. This can be accomplished by burning the stand in late winter or early spring to reduce the biomass. Then roller drum chop the area prior to the summer rainy season with a chopper heavy enough to sever saw palmetto stems (probably a

medium or heavy, single or tandem, but not offset). A second burn in the summer after the chopping is complete would be beneficial if a fire will carry.

In natural stands with BA exceeding 30 sq. ft. per acre, some trees may have to be removed prior to chopping the understory. This will facilitate equipment movement. Spacing between leave trees or clusters of leave trees should be at least 30 feet to give room for the tractor and roller-drum chopper to operate without damaging residual trees.

Close mowing with a heavy-duty brush cutter is another method sometimes used to reduce and control the height of saw palmettos. Although, any kind of mowing operation may be impossible in many of these stands due to the large amount of exposed rock. Hitting hard limerock hidden in the underbrush could destroy expensive equipment.

If for any reason an adequate number of young seedlings are not established by the second summer following the initial chopping, burn the stand again prior to end of the rainy season. This will allow some grasses to re-grow enough to protect the seeds and fragile seedlings.

Once 1,000 or more seedlings per acre are established and growing, withhold fire from the stand for at two to three years. Fire should be reintroduction to the system by following the directions contained in the *Prescribed Fire* section below.

ARTIFICIAL –

Hand Planting – Hand planting of either bare-root or containerized (tubeling) LLP seedlings is one option for reestablishment in areas where an inadequate number of seed trees exists. Bare-root trees are planted in the winter. Tubelings can be planted in winter or summer, thereby extending the planting season.

Plant approximately 600 seedlings per acre at varying spacing, but averaging 6’ X 12’ overall. Due to the increased likelihood of survival and higher cost of containerized seedlings, as few as 400 seedlings per acre can be planted.

A word of caution about hand planted tubelings. Competition from grasses for soil moisture during hot, dry weather can cause severe losses of young seedlings. To ensure seedling survival, some form of herbicidal control may be necessary. Applying a contact herbicide such as Roundup either in 2’ wide strips or in spots can control these grasses. The herbicide should be applied far enough in advance of planting time (at least one month) so that the grasses have time to “brown up” and indicate where to plant the seedlings.

Machine Planting – This method of seedling establishment will not be possible in stands with protruding rocks. However, in rock-free areas it is an excellent way to insure seedling survival.

Meander planting bare-root or containerized LLP seedlings at an average spacing of 6' X 12' yields about 600 trees per acre. It is more difficult to vary the spacing and make the planting look random with machine planting. This is due primarily to the inability of tree planters to make sharp turns and still pack the soil around the seedlings roots. Tight turns are also hard on the planter's bearings. The desired effect can be obtained by gradually curving the planting rows and varying the distance between and within the rows. Another way to create the random look is to locate the planting rows twice as far apart as normal (averaging approximately 24'). Then, plant a second set of rows at some angle approaching 90 degrees to the first set of rows spaced about the same distance apart.

Again competition for soil moisture during dry weather can cause heavy losses of seedlings and waste of planting costs. Where grass is thick, it is best to either herbicide strips as described above or use a combination planter/scalper to plant the seedlings. The scalper should be set to no more than 2 to 3 inches deep and 18 to 24 inches wide. These settings will minimize soil disturbance and maintain continuity of fuels for future prescribed burns, but the seedlings will have a decent chance of survival.

PRESCRIBED FIRE

Florida flatwoods ecosystems are fire dependent. Lightning sparked fires are natural to these communities. Prior to European settlement, wildfire occurred in the flatwoods at regular intervals of one to five years.

Saw palmetto and cabbage palm have always been minor components of flatwoods ecosystems or adjacent hardwood hammocks. Although the exact mechanism is not know, frequent wildfires kept their numbers under control. However, with the introduction of effective fire suppression in the mid-1900's, saw palmettos and cabbage palms invaded the flatwoods. Dense shade caused by the proliferation of these hardy species results in the loss of other grassy and herbaceous ground covers. Less fine-fueled ground covers to carry fire resulted in more palms and deeper shade.

Fires in palm and palmetto dominated systems tend to be less frequent and more intense than in areas with more grasses. These extreme fires do not adversely affect the palms, but most other overstory plants including pines are affected. Hot fires can kill pine trees directly or weaken them enough to enable insects to kill them. Lack of mature pines means loss of pine needle leaf litter that normally helps support less severe ground fires.

The intelligent use of prescribed fire is essential to the restoration and maintenance of open healthy, pine-dominated ecosystems. As desirable as burning is, caution must be exercised when reintroducing fire into these systems. Survival of newly established pine seedlings depends on timing and careful execution of burns. To prevent damage to

delicate root systems and avoid smoky duff fires, be sure that there is adequate moisture in any organic matter thicker than approximately one inch. In stands with heavy duff layers, try to burn no more than one inch of duff at a time on approximately two to three-year intervals. At least the first burn should be during the dormant season before the majority of seedlings have initiated height growth or after they have reached at least six feet. To reduce seedling mortality, consider conducting the first burn during winter months at night. If ground fuels are not too heavy, succeeding burns can be switched to the growing season.

ACCESS

Most of the original Hollinswood portion of CRSBP has an adequate system of limerock reinforced woods roads. These roads were installed with timber harvest in mind and provide good access. Hard surfaced crossings may need to be installed in a few areas where roads and drainage patterns conflict.

The Williams Tract fronts on U.S. Highway 19 that should provide ample access for any timber management needs. A neighborhood subdivision street is the only access to the Sterchi Tract. This road will not support much heavy truck traffic. However, only very occasional thinning operations are envisioned for this block. The gate will have to be realigned to allow trucks to pull straight onto the street. If truck traffic is not allowed on the subdivision street, an alternate might be the road that adjoins the tract on the south side. Use of this alternative would require the cutting of a new road through the woods to the boundary.

The northern “scrub” has access from a paved county road, but the interior roads are made of soft sand. Little active timber harvesting is seen for this block other than very occasional thinning of pines along wetland margins. However, some road maintenance will be needed for prescribed burning and other land management activities.

SUMMARY

Reestablishment of native pine trees is essential to restoring healthy flatwoods ecosystems to Crystal River State Buffer Preserve. Reintroduction of periodic fire is another requirement of these systems. The needles, annually shed by native pine trees, are an important carrier of fire in Florida’s forests. Success of the prescribed burning program will likely depend on the ability of managers to continue growing pine trees. Timber sales are used to maintain vigorous stands of pine trees and maintain more open canopies. Revenues from these timber sales can make a significant contribution toward management expenses on CRSBP.

Appendix 10

Fire Management Plan

Fire Management Plan
Crystal River Preserve State Park

Background

The natural role of fire in shaping Florida's landscape and ecosystems has been well documented. Nearly every community type in Florida, on some time scale, is shaped by fire. Florida's summer thunderstorms often generate tremendous amounts of cloud to ground lighting strikes, which is the natural origin of Florida fires. The majority of Florida natural fires occur in the late spring and early summer. This happens after the natural dry season (winter) when daytime heating, humidity, and sea breezes combine to create the first thunderstorms. As these thunderstorms return to a landscape that is still dry from the winter, the stage is set for natural fire started by lightning. These natural fires burned slowly and traveled great distances before being exterminated naturally.

Unfortunately, since the early 1900's fire in America has been viewed as a destructive force and fire suppression became standard practice to prevent loss of life and property. However, due to an increased understanding of the natural communities and the natural role of fire in maintaining their health over the past thirty years or so, fire has been re-introduced by land managers as a management tool. Prescribed fire has become the primary tool that land managers in Florida use to restore and manage our unique ecosystems.

Prior to acquisition by the state, many areas of the preserve were intensively managed for timber and cattle production. Past timber harvesting and naval stores activity is still evident throughout the area. On the Hollins tract, most of the suitable ground was clear-cut of a majority of the native pines, site-prepared and replanted with North Florida slash pine in the early 1970's. Primarily, trees left standing were too small, crooked, or deformed to be useful as saw timber. Although, small pockets of native slash and longleaf pines still remain especially in or around wet areas and hammock lands. Some salt marsh islands were bedded and planted at the same time as the original planting.

This history of silviculture along with fire suppression (which has affected many areas of Florida) has resulted in many areas of the preserve being overgrown and unhealthy. This has resulted with many areas have extremely high fuel loads that make prescribed fire somewhat risky. Where adequate firebreaks exist however, prescribed fire has been used at preserve since acquisition by the state to restore these systems.

Objectives

The fire management objective of the Crystal River Preserve State Park is to re-introduce fire as an ecosystem shaping process. This will be done in order to:

- Restore or preserve fire adapted community types.
- Restore or preserve habitat for rare plant and animal species.
- Create a mosaic of vegetation by varying intensity, frequency, timing and season of burns within and between natural communities.
- Promote diversity within natural communities.
- Reduce hazardous fuel loading.
- Maintain natural transition zones (ecotones) between communities.
- Reduce the possibility of uncontrollable, dangerous wildfires.

In order to accomplish these objectives the preserve has been separated into burn zones. These burn zones utilize firebreaks, both natural (wetlands and surface waters) and manmade (roads, trails, and hard lines). A zone specific prescription will be written (for new zones) or revised (for existing zones to take into account vegetation changes).

Research and monitoring is an important component of land management at Crystal River and techniques such as vegetative sampling and photo points are used to determine the effectiveness of burns to meet management goals. The Crystal River Preserve State Park also provides and receives assistance from the USFWS, FWC, and DOF.

Prescribed Fire Frequency

The community type determines burn frequency. Some communities require frequent fires to perpetuate themselves while others are adapted to infrequent catastrophic fires. Some communities are not adapted to fire and require fire exclusion for their continued existence. The following fire adapted communities occur at the Crystal River Preserve State Park:

Community	Fire frequency
Basin Marsh	1-3 years
Tidal Marsh	8-25 years
Marsh (Prairie) Hammock	8-25 years
Wet Prairie	2-4 years
Mesic Flatwoods	1-8 years
Sandhill	2-5 years
Scrub	8-25 years
Scrubby Flatwoods	8-25 years

Due to the overgrown nature of many of the communities of the preserve it may be necessary to burn some areas more frequently in order to achieve restoration goals and bring the communities into a more natural state. Due to the obviously long fire frequency interval for some communities, these communities are not very pyrogenic. Due to their relative inability to burn, these areas make excellent natural firebreaks and will be used as such in all but the most severe drought conditions.

Prescribed fire timing and type of fire

The seasonal timing of ecological burns is as important as their frequency. Growing season (late spring and early summer) burns are the most effective for controlling hardwood encroachment into more pyrogenic communities. Most prescribed fires should occur during the natural fire season, from April to August. However, several factors make this difficult. The first of which is the often unpredictable weather in a coastal location. As the temperatures warm in spring and summer daily sea breezes may occur at any time during the day. When a sea breeze occurs it can often result in a 180° change in wind direction, a drop in temperature, and a drop in humidity. Another complicating weather factor is when some habitats such as scrub become dry enough to burn, it often means that the KBDI is high enough that DOF will not issue burn authorizations for the fear of wildfires. Florida also can receive enormous amounts of rain from a single storm; rainfall often exceeds 1” in a single storm. This can mean that an area that may have perfect conditions one day may to burn and may be far too wet to burn the next. Furthermore, staff at Crystal River have documented that burning from late October to early December can result in high pine mortality, due to the fact that at this time of year pines are sending their carbohydrate stores to their roots and can be easily stressed by a fire. Burning areas with high fuels loads in the summer can also result in extreme fire behavior, which makes control difficult and may result in very high fire intensities that may also result in pine mortality.

While all these factors often complicate the conduction of fires, through the years Crystal River has been fairly successful at burning. Winter burns have been successfully conducted at Crystal River (as elsewhere through the southeast) to reduce fuel loads. Variations within the year are important to promote diversity of different plant communities. Spring and early fall burns are preferred to control hardwood encroachment into pine flatwoods. Marsh burns may be conducted at nearly any time of the year, as plants like *Juncus* and *Spartina* can still burn with high moisture contents. In areas with extensive palmetto, where standing water is not present, fire can also burn at virtually any time of the year.

Some areas of the preserve are so overgrown that high intensity restoration fires may be necessary, usually in locations that were utilized for silviculture. This will only be conducted in areas that are dominated by off-site planted slash pine and longleaf pine is minimal. At the north end of the preserve several areas of scrub exist. This scrub has not burned in over 25 years. Due to the natural role of fire in scrub, as a high intensity catastrophic fire, this area will be burned to simulate a natural scrub fire. In both of these situations, surrounding areas will be burned prior with low intensity fires designed to consume as much fuel as possible so that if a spot-over were to occur it would not be able to carry. Also, hardened fire lines (based upon existing trails) and coordination with DOF will be used to achieve the special goals of these areas.

Wildfire Policy

Every attempt is made with DOF and local fire departments to coordinate wildfire response. Where possible Crystal River Preserve State Park prefers wildfires be allowed to burn out naturally. However, if life, property, or escape to adjacent parcels not managed by Crystal River is imminent, we will defer to the judgment of responding firefighters and assist in fire suppressions activities. Crystal River has a Type VI Hummer, several ATV's (including a six wheel ATV), and a 200-gallon slip on unit for a pick up truck, which have been used to assist in suppression and mop up operations. Every attempt will be made to minimize disturbance that may result from fire suppression activities. Where disturbance is unavoidable, mitigation will be used after fire suppression.

Safety/Equipment

During a prescribed fire or a wildfire safety will be always be the most important factor. All staff are required to complete S-130, S-190, and Standards for Survival. Staff are also encouraged to take Basic Interagency Prescribed Fire, I-200, Southern Areas Engine Academy, etc… Staff are also required to be fit enough to conduct a prescribed burn without being a danger to themselves or others. The fire manager shall designate a safety officer on every fire.

All personnel are required to wear the following:

- Nomex (or Indura cotton) pants and shirts.
- Leather gloves.
- Helmet.
- Leather boots (minimum 9").
- Fire safety shelter.
- Eye protection (face shield, goggles, or safety glasses).
- Radio.

The following are strongly recommended:

- Nomex ear/neck shroud.
- Headlamp or flashlight.
- Compass.
- Canteen or hydration system.
- Airway protective device (filter mask).

Smoke Management

A smoke management screening process to identify smoke sensitive areas before conducting a prescribed fire and will accompany the prescription. In general, an easterly component is required for most burns at Crystal River in order to avoid impacts to the City Of Crystal River, US 19, Crystal river Airport, and Seven Rivers Hospital. Other smoke sensitive areas include the communities of Ozello, Homosassa, Inglis, Dixie Shores and roads such as Ft. Island Trail, Ozello Trail, Powerline Road.

Firelines

Firelines are an integral part of any burn prescription. DNR Directive 910, which directs the types of natural and artificial firebreaks, will be adhered to.

The existence of fire lanes is no substitute for vigilance by the staff assigned to observe them during the burn. A spot-over can occur during momentary wind shifts resulting in an uncontrolled fire if staff is not alert at all times

Legal Requirements

Authorization to conduct a prescribed burn must be obtained by phone from DOF on the day of the burn. Authorization is good for one day only and must be renewed if burning is continuing past dark. The person requesting the burn permit is legally responsible for the fire and any problems resulting from the fire.

A prescribed burner, who adheres to Chapter 590.026 FS, shall be protected from liability for damage or injury caused by fire or resulting smoke, unless negligence is proven. Adhering to Chapter 590.026 FS requires that the permitted fire manager has completed Basic Interagency Prescribed Fire, has provided their burn number to DOF when requesting authorization to burn, is present during the burn, and is operating within the parameters described in the prescription.

Appendix 11

Known Archaeological and Historic Sites on the Crystal River Preserve State Park

Master Inventory
of
Archaeological Sites
(revised version)

Site Number	Site Name	Affiliation	Quadrangle
8CI00001	CRYSTAL RIVER INDIAN MOUNDS	DEPT,SWF,WE,SAFE	RED LEVEL
8CI00002	BUZZARD'S ISLAND	FTWL,SAFE	CRYSTAL RIVER
8CI00004	SALT RIVER 1	PREH	RED LEVEL
8CI00010	MOUND NEAR CRYSTAL RIVER	PREH	CRYSTAL RIVER
8CI00011	GREENLEAF PLACE	PREH	HOMOSASSA
8CI00012	CRYSTAL RIVER 1	PREH	HOMOSASSA
8CI00013	BLACK POINT	SJ,WE,HIST	RED LEVEL
8CI00014	TONY CREEK	PREH	YANKEETOWN
8CI00015	CHAIR ISLAND	PREH	RED LEVEL
8CI00017	ROCK LANDING	PREH	RED LEVEL
8CI00018	CRYSTAL RIVER PINEWOODS	PREH	CRYSTAL RIVER
8CI00019	HAMMOCK MOUND	PREH	HOMOSASSA
8CI00020	NO NAME	UNKN	HOMOSASSA
8CI00021	MOUTH OF CRYSTAL RIVER	PREH	HOMOSASSA
8CI00022	MULLET KEY	DEPT,WE,SAFE,SPN	WITHLACOOCHEE BAY
8CI00025	NO NAME	WE,SAFE,EURO	OZELLO
8CI00026	SHELL ISLAND	SJ,WE	OZELLO
8CI00030	OZELLO 1	WEII	OZELLO
8CI00031	NO NAME	PREH	RED LEVEL
8CI00035	RANDALL CROFT LODGE	PREH	RED LEVEL
8CI00036	CRYSTAL RIVER 2	PREH	RED LEVEL
8CI00037	NO NAME	WE,SAFE	RED LEVEL
8CI00038	JAKE'S DROP	DEPT,WE,SAFE	RED LEVEL
8CI00039	NO NAME	DEPT,WE	RED LEVEL
8CI00040	TEMPLE MOUND SITE	PREH	RED LEVEL
8CI00041	SHELL MOUNDS	SJ,WE	RED LEVEL
8CI00042	WASH ISLAND	ORAN,DEPT	RED LEVEL
8CI00043	SHELL ISLAND 2	TRAN,WE,SAFE	RED LEVEL
8CI00044	COW ISLAND	PREH	RED LEVEL
8CI00045	OZELLO 2	PREH	OZELLO
8CI00047	CRYSTAL RIVER HIGHLANDS MOUND	PREH	HOMOSASSA
8CI00048	NORTHEAST TIGERTAIL BAY	TRAN,DEPT,WEII	OZELLO
8CI00049	NO NAME	PREH	HOMOSASSA
8CI00050	CREVASSE ISLAND	WEII	OZELLO
8CI00051	GARD MOUND	WEII,SAFE	HOMOSASSA
8CI00052	OZELLO	WE	OZELLO
8CI00053	VANCE VILLAGE	WE	HOMOSASSA
8CI00054	VANCE BURIAL MOUND	WEI	HOMOSASSA
8CI00058	BURTINE ISLAND A	DEPT	RED LEVEL
8CI00059	BURTINE ISLAND B	PREH	RED LEVEL
8CI00060	BURTINE ISLAND C	PERI,DEPT	RED LEVEL
8CI00061	BURTINE ISLAND D	PERI,DEPT,WEI,WEII	RED LEVEL
8CI00062	CAPTAIN JOE ISLAND 1	PREH	RED LEVEL
8CI00063	CAPTAIN JOE ISLAND 2	WE	RED LEVEL
8CI00064	EVERETT ISLAND	PREH	RED LEVEL
8CI00065	RICHARDSON CREEK	PREH	RED LEVEL
8CI00066	FLORIDA BARGE CANAL 1	PREH	YANKEETOWN
8CI00067	FLORIDA BARGE CANAL 2	PREH	YANKEETOWN

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8CI00068	FLORIDA BARGE CANAL 3	PREH	YANKEETOWN
8CI00084	HOTEL HOMOSASSA SPRINGS SITE	PREH	HOMOSASSA
8CI00087	OZELLO 3	PREH	OZELLO
8CI00088	OZELLO 5	PREH	OZELLO
8CI00091	NO NAME	WE	RED LEVEL
8CI00092	NO NAME	PREH,WE,HIST	RED LEVEL
8CI00093	NO NAME	SWF,WE	RED LEVEL
8CI00094	NO NAME	PREH	RED LEVEL
8CI00096	NN	ARC,SJ,SWF	YANKEETOWN
8CI00097	HOLLIMAN'S BLOCKHOUSE	AMER	YANKEETOWN
8CI00098	NN	WE	YANKEETOWN
8CI00099	NN	WEI	YANKEETOWN
8CI00100	NN	PREH	YANKEETOWN
8CI00101	PAT'S ELBOW	DEPT,WE	YANKEETOWN
8CI00102	NN	WE	YANKEETOWN
8CI00103	FLORIDA POWER COMPANY 21	PREH	RED LEVEL
8CI00104	DRUM ISLAND	DEPT,WE	RED LEVEL
8CI00105	FLORIDA POWER COMPANY 19	PREH	RED LEVEL
8CI00106	FLORIDA POWER COMPANY 18	PREH	RED LEVEL
8CI00107	FLORIDA POWER COMPANY 17	PREH	RED LEVEL
8CI00108	FLORIDA POWER COMPANY 16	PREH	RED LEVEL
8CI00109	FLORIDA POWER COMPANY 15	PREH	RED LEVEL
8CI00110	FLORIDA POWER COMPANY 14	PREH	RED LEVEL
8CI00111	FLORIDA POWER COMPANY 13	PREH	RED LEVEL
8CI00112	FLORIDA POWER COMPANY 12	WE	RED LEVEL
8CI00113	FLORIDA POWER COMPANY 11	WE	RED LEVEL
8CI00114	FLORIDA POWER COMPANY 10	WE	RED LEVEL
8CI00115	FLORIDA POWER 9	PREH,DEPT,WE	RED LEVEL
8CI00116	FLORIDA POWER COMPANY 8	PREH	RED LEVEL
8CI00117	FLORIDA POWER COMPANY 7	WE	RED LEVEL
8CI00118	FORT ISLAND SITE	ARCL,WE	RED LEVEL
8CI00119	NEGRO ISLAND	PREH	RED LEVEL
8CI00120	FLORIDA POWER COMPANY 6	PREH,HIST	RED LEVEL
8CI00121	FLORIDA POWER COMPANY 43	WE	RED LEVEL
8CI00124	YULEE SUGAR MILL HISTORIC MEMORIAL	AMER	HOMOSASSA
8CI00127	MCKINNEY MIDDEN	PREH	HOMOSASSA
8CI00128	GOVERNOR'S ISLAND	PREH	OZELLO
8CI00129	COFFIN POINT	PREH	OZELLO
8CI00130	GUSTAF BAY	PREH	OZELLO
8CI00131	TIGER TAIL ISLAND	PREH	OZELLO
8CI00132	TIGER TAIL BAY	PREH	OZELLO
8CI00135	BUD NELSON MEMORIAL	WE	OZELLO
8CI00136	TIGER TAIL BAY MIDDEN	WE,SAFE	OZELLO
8CI00137a	NORTH SHIVERS BAY MIDDEN A	WE	OZELLO
8CI00137b	NORTH SHIVERS BAY MIDDEN B	WE,TRAN	OZELLO
8CI00138	SALT RIVER 2	PREH	OZELLO
8CI00139	GRAVEYARD	PREH	HOMOSASSA
8CI00140	EAST GRAVEYARD	PREH	HOMOSASSA
8CI00141	ONE POLE SITE	WE	HOMOSASSA

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8CI00158	BOMBROLLER SITE	PREH	CRYSTAL RIVER
8CI00204	MARINE SCIENCE STATION	DEPT,WE	RED LEVEL
8CI00208	HOMOSASSA SPRING	PALE,ARC	HOMOSASSA
8CI00209	HOMOSASSA SPRING MIDDEN	PREH	HOMOSASSA
8CI00224	SPICE KEY	PREC	RED LEVEL
8CI00225	FOUR PALMS	PREC	RED LEVEL
8CI00226	NO NAME	PREC,AMER	OZELLO
8CI00227	NO NAME	PREC	OZELLO
8CI00228A	NO NAME	PREC	OZELLO
8CI00228B	NO NAME	PREH	OZELLO
8CI00229	NO NAME	PREC	OZELLO
8CI00230	NO NAME	PREH	OZELLO
8CI00231	NO NAME	PREH	OZELLO
8CI00232	NO NAME	PREH	OZELLO
8CI00233	NO NAME	PREH	OZELLO
8CI00234	NO NAME	PREH	OZELLO
8CI00336	KAH'S BEACH	WE	YANKEETOWN
8CI00412	CITRUS SPRINGS SITE	WEI,SAFE	HOMOSASSA
8CI00414	PARKING LOT SITE	PREA	HOMOSASSA
8CI00417	CHAIR ISLAND	WEI,SAFE,LEJE	OZELLO
8CI00418	SALT RIVER NARROWS 1	DEPT	OZELLO
8CI00419	SALT RIVER NARROWS 2	WEI	OZELLO
8CI00421	GREEN'S PLACE	WE	OZELLO
8CI00427	STONEY LAND TRACT I	PREC,WE	OZELLO
8CI00444	LAST ISLAND	PREH	UNKNOWN
8CI00448	WILLIAMS MOUND	UNKN	RED LEVEL
8CI00449	STONE WALL	AMER	HOMOSASSA
8CI00450	WHITE SAND HAMMOCK	PREA	HOMOSASSA
8CI00451	WILLEY POINT	DEPT,SWF	OZELLO
8CI00452	DECIDUE-MILTON MIDDEN	DEPT,WE,SAFE	OZELLO
8CI00566	JOHN BROWN I	DEPT,PREC	OZELLO
8CI00567	JOHN BROWN II	DEPT,PREC	OZELLO
8CI00568	JOHN BROWN III	DEPT,PREC	OZELLO
8CI00569	JOHN BROWN IV	DEPT,PREC	OZELLO
8CI00570	JOHN BROWN V	DEPT,PREC	OZELLO
8CI00572	CANNON CEMETERY	HIST,PREH	OZELLO
8CI00575	BAGLEY COVE	ARC,DEPT,SWF,PREC	CRYSTAL RIVER
8CI00576	OPPOSITE THE ROCKS SITE	DEPT,PREC	RED LEVEL
8CI00577	NORTH COON GAP	DEPT,WE,SAFE	RED LEVEL
8CI00578	SOUTH SALT RIVER I	DEPT,WE,SAFE	RED LEVEL
8CI00579	SOUTH SALT RIVER II	DEPT	RED LEVEL
8CI00580	BATTLE CREEK I	DEPT,PREC	OZELLO
8CI00581	BATTLE CREEK II	DEPT,PREC	OZELLO
8CI00582	SOUTH TIGER TAIL BAY I	DEPT,PREC	OZELLO
8CI00583	SOUTH TIGER TAIL BAY II	DEPT,PREC	OZELLO
8CI00584	BELL ISLAND SOUTH	DEPT,PREC	OZELLO
8CI00585	WILLEY POINT 1	DEPT,PREC	OZELLO
8CI00586	WILLEY POINT II	DEPT,PREC	OZELLO
8CI00587	HELL GATE SOUTH	PREC	OZELLO

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8CI00588	HELL GATE WEST I	PREC	OZELLO
8CI00589	HELL GATE WEST II	PREC	OZELLO
8CI00590	GUSTAF BAY EAST	DEPT,PREC	OZELLO
8CI00591	DORSEY SITE	DEPT,WE,SAFE,PREC	OZELLO
8CI00592	WEST HOMOSASSA I	DEPT,PREC	OZELLO
8CI00593	WEST HOMOSASSA II	PREC	OZELLO
8CI00594	WEST HOMOSASSA III	PREC	OZELLO
8CI00595	WEST HOMOSASSA IV	PREC	OZELLO
8CI00596	SHELL ISLAND EAST	DEPT,PREC	OZELLO
8CI00597	SHELL ISLAND NORTH	PREH	OZELLO
8CI00598	SHELL ISLAND WEST	PREH	OZELLO
8CI00599	DOG ISLAND	PREH	OZELLO
8CI00600	OUTER DEEP CREEK	PREH	OZELLO
8CI00601	FALSE CHANNEL ISLAND	ORAN,DEPT,SJ,WE,SAFE	OZELLO
8CI00602	GUSTAF BAY ISLAND	DEPT	OZELLO
8CI00603	GUSTAF BAY EAST-NORTH SHORE	DEPT,WE,SAFE	OZELLO
8CI00604	HELL GATE WEST III	PREH	OZELLO
8CI00605	WILLEY POINT III	PREH	OZELLO
8CI00606	BELL ISLAND NORTH	PREH	OZELLO
8CI00607	LASHLEY POINT I	DEPT,WE,SAFE	OZELLO
8CI00855	CARDINAL POND SITE	ARCM,TRANS,WE	HOMOSASSA
8CI00857	JOHN BROWN VI	PREH	OZELLO
8CI00869	LITTLE HOMOSASSA RIVER I	DEPT,WE	OZELLO
8CI00870	LITTLE HOMOSASSA RIVER II	WE	OZELLO
8CI00871	LITTLE HOMOSASSA RVER III	PREH	OZELLO
8CI00872	LITTLE HOMOSASSA RIVER IV	DEPT	OZELLO
8CI00873	LITTLE HOMOSASSA RIVER V	WE	OZELLO
8CI00874	LITTLE HOMOSASSA RIVER Vb	PREH	OZELLO
8CI00875	LITTLE HOMOSASSA RIVER VI	PREH	OZELLO
8CI00876	LITTLE HOMOSASSA RIVER VII	PREH	OZELLO
8CI00877	LITTLE HOMOSASSA RIVER VIII	PREH	OZELLO
8CI00878	LITTLE HOMOSASSA RIVER IX	WE	OZELLO
8CI00879	LITTLE HOMOSASSA RIVER X	PREH	OZELLO
8CI00880	LITTLE HOMOSASSA RIVER XI	PREH	OZELLO
8CI00881	LITTLE HOMOSASSA RIVER XII	PREH	OZELLO
8CI00882	LITTLE HOMOSASSA RIVER XIII	WE	OZELLO
8CI00883	LITTLE HOMOSASSA RIVER XIV	DEPT,WE	OZELLO
8CI00884	LITTLE HOMOSASSA RIVER XV	DEPT,WE,PREC	OZELLO
8CI00885	LITTLE HOMOSASSA RIVER XVI	PREH	OZELLO
8CI00904	DAVIS SITE	WE	HOMOSASSA
8CI00990	OTTER I	ARCM,ARCL, PREA	HOMOSASSA
8CI00991	BLUEBIRD SPRINGS MIDDEN	PREA	HOMOSASSA
8CI01059	CATTLE PEN HAMMOCK	WE1	RED LEVEL
8CI01060	NORTH LASHELY 1	TRAN,DEPT,WE	OZELLO
8CI01061	NORTH LASHELY 2	WE	OZELLO
8CI01062	NORTH LASHELY 3	WE	OZELLO
8CI01063	NORTH LASHLEY 5	PREH	OZELLO
8CI01064	NORTH LASHELY 6	WE	OZELLO
8CI01065	GAME CREEK 1	PREH	OZELLO

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8CI01066	MUD CREEK 1	WE	OZELLO
8CI01067	MUD CREEK 2	PREH	OZELLO
8CI01068	NARROWS 1	PREH	OZELLO
8CI01069	POINT 1	WE	OZELLO
8CI01076	LOWER WITHLACOOCHEE	DEPT,WE	YANKEETOWN
8CI01089	BENNETS CREEK 1	PALE,ARCE,ORAN,DEPT,WE	YANKEETOWN
8CI01090	BENNETS CREEK 2	DEPT,WE	YANKEETOWN
8CI01134	BUCKFORD 1	DEPT, WE	RED LEVEL
8CI01135	BUCKFORD 2	PREH	RED LEVEL
8CI01136	WEKIWA	DEPT,WE	RED LEVEL
8CI01137	SINTE 1	WE	RED LEVEL
8CI01138	SINTE 2	PREH	RED LEVEL
8CI01139	BEATEN FACE	PREH	RED LEVEL
8CI01140	THLA'FAKKE 1	PREH	RED LEVEL
8CI01141	LITTLE PEAK	DEPT,WE	RED LEVEL
8CI01142	THLA'FAKKE 2	PREH	RED LEVEL
8CI01143	STUCK NOWHERE	DEPT	RED LEVEL
8CI01144	BLOWING WILLOWS	DEPT,WE	RED LEVEL
8CI01145	FALLING OFF THE ROCK	PREH	RED LEVEL
8CI01146	MANY PLACES	DEPT	RED LEVEL
8CI01147	CRUNCHY GROUND	PREH	RED LEVEL
8CI01148	OLD SNAKE'S PATH	PREH	RED LEVEL
8CI01149	BERRY CAKES	PREH	RED LEVEL
8CI01150	GRANDFATHER EGRET'S POOL	PREH	RED LEVEL
8CI01151	MOTHER'S DIMPLE	PREH	RED LEVEL
8CI01152	MOVING DIRT	PREH	RED LEVEL
8CI01153	TWO ROCK HOUSES	DEPT	RED LEVEL
8CI01154	CRAB WARRIORS	DEPT	RED LEVEL
8CI01155	GOSSIPING PALMS	PREH	RED LEVEL
8CI01156	LIMUS	PREH	RED LEVEL
8CI01157	TERRAPIN WIPES HIS NOSE	PREH	RED LEVEL
8CI01158	WEEPING ROCK	PREH	RED LEVEL
8CI01159	NOISY WOODS	DEPT	RED LEVEL
8CI01160	COOL PLACE TO SIT	DEPT,WE	RED LEVEL
8CI01161	DYING CEDARS	PREH	RED LEVEL
8CI01162	GRANDMA SITS ALONE	PREH	RED LEVEL
8CI01163	FISH SPLASHERS	PREH	RED LEVEL
8CI01164	FIERY PALMS	DEPT,HIST	RED LEVEL
8CI01165	ROCKY PLACE	DEPT	RED LEVEL
8CI01166	BROKEN CUPS	PREH	RED LEVEL
8CI01167	BIRD TOWN	PREH	RED LEVEL
8CI01168	POND IN THE ROCK	PREH	RED LEVEL
8CI01169	J.D.'S SITE	WEI	RED LEVEL
8CI01170	KATHY'S SITE	DEPT	RED LEVEL
8CI01171	VICKY'S SITE	PREH	RED LEVEL
8CI01172	TOM'S SITE	PREH	RED LEVEL
8CI01173	KEITH'S SITE	DEPT,WEI	RED LEVEL
8CI01174	JERRY'S SITE	DEPT,WEI	RED LEVEL
8CI01175	CHRIS' SITE	DEPT,WEI	RED LEVEL

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8CI01176	CHAD'S SITE	DEPT,WEI	RED LEVEL
8CI01177	OYSTER BRIDGE	DEPT,WEI	RED LEVEL
8CI01178	MELISSA'S SITE	PREH	RED LEVEL
8CI01179	SETH'S SITE	DEPT,WEI	RED LEVEL
8CI01180	DAVEY'S SITE	PREH	RED LEVEL
8CI01181	JEANNE'S SITE	PREH	RED LEVEL
8CI01182	TELLING SECRETS	PREH	RED LEVEL
8CI01183	FEET GETTING WET	PREH	RED LEVEL
8CI01184	EVERETT ISLAND 1	PREH	RED LEVEL
8CI01185	EVERETT ISLAND 6	DEPT,WEI	RED LEVEL
8CI01186	TURTLE LEFT HIS SHELL	PREH	RED LEVEL
8CI01187	SCORPION PALACE	PREH	RED LEVEL
8CI01188	TOPPLED CEDARS	WE	RED LEVEL
8CI01189	EVERETT ISLAND 2	PREH	RED LEVEL
8CI01190	EVERETT ISLAND 3	PREH	RED LEVEL
8CI01191	EVERETT ISLAND 4	PREH	RED LEVEL
8CI01192	EVERETT ISLAND 5	DEPT,WEI	RED LEVEL
8CI01193	CAMP ISLAND	DEPT,WE	RED LEVEL
8CI01194	KEITH'S 2	PREH	RED LEVEL
8CI01195	WASTED	PREH	RED LEVEL
8CI01196	ALL WASHED UP	PREH	RED LEVEL
8CI01197	SICKLE MIDDEN	DEPT,WEI,HIST,SEMI	RED LEVEL
8CI01198	OFUNLU MIDDEN	ARC,PREH	RED LEVEL
8CI01199	ETOH MIDDEN	PREH	RED LEVEL
8CI01200	HIDDEN MIDDEN	ARC,PREH	RED LEVEL
8CI01201	ILLIFOKI	WEI	RED LEVEL
8CI01202	CHIENTO ILLIFOKI MIDDEN	WEI	RED LEVEL
8CI01203	EAST PENINSULA POINT	WEI	RED LEVEL
8CI01204	WASH ISLAND SHADOW	DEPT,WEI,WEII	RED LEVEL
8CI01205	LAKACHE	DEPT,WEI	RED LEVEL
8CI01206	LAND'S END	DEPT,WEI,WEII	RED LEVEL
8CI01207	LOST CEDAR	DEPT,WEI,WEII	RED LEVEL
8CI01208	GOMEZ MIDDEN	DEPT,WEI	RED LEVEL
8CI01209	KINGS CREEK MIDDEN	PREH	RED LEVEL
8CI01210	DYING PALMS MIDDEN	DEPT,WEI	RED LEVEL
8CI01211	ROCKS EAST	WEI,HIST	RED LEVEL
8CI01212	DEER MOUTH	PREH	RED LEVEL
8CI01213	DEER CREEK 1	PREH	RED LEVEL
8CI01214	DEER CREEK 2	PREH	RED LEVEL
8CI01215	PIG'S LAST STAND	WEI	RED LEVEL
8CI01216	EAGLE SCOUT HILL	ARCM,ARCL	RED LEVEL
8CI01217	MOTHER OSPREY	DEPT,WEI	RED LEVEL
8CI01218	DEER CREEK 3	ARCL,PREH	RED LEVEL
8CI01219	DEER CREEK 4	ARCL,PREH	RED LEVEL

Appendix 12

Recommended Acquisition Priorities for Crystal River Preserve State Park

Appendix 12: Recommended Acquisition Priorities for Crystal River Preserve State Park (in priority order)			
Parcel Number	**Acres**	**Property Description**	**Acquisition Reason**
Parcels within Florida Forever Project boundaries			
1002818	26	Parcel on Crystal River with proposed easement through preserve lands. Hydric Hammock.	Boundary continuity, access control, water quality
2280280, 2351861	36	Parcel on Bagley's Cove surrounded by the preserve. Hydric Hammock and Flatwoods	Boundary continuity, access control, water quality
1094275, 1094461, 1094267, 1094283, 2324171, 1014786	114	Largest remaining undeveloped parcel on King's Bay. Hydric Hammock, Wet Flatwoods	Water quality, boundary continuity, natural resource value.
1002907	132.5	Large undeveloped parcel on the Crystal River. Surrounded by preserve lands. Primarily saltmarsh with marsh hammocks.	Water quality, boundary continuity.
1002885	79.8	Large undeveloped parcel on the Crystal River. Surrounded by preserve lands. Primarily saltmarsh with marsh hammocks.	Water quality, boundary continuity.
1002788	18.8	Parcel behind headquarters building. Primarily saltmarsh with marsh hammocks.	Water quality, boundary continuity.
1001676	159	Large parcel on the Withlacoochee River. Floodplain forest and swamp, freshwater marsh, hydric hammock.	Water quality, access control, natural resource value.
1001722, 2610395, 1000009, 1000017, 1000050	83	Parcel on the Withlacoochee River. Floodplain forest and swamp, freshwater marsh, hydric hammock.	Water quality, access control, natural resource value.
1002851	4.4	Parcel on the Crystal River. Saltmarsh and marsh hammocks.	Water quality, boundary continuity.
2528460	5	Parcel on the Crystal River. Saltmarsh and marsh hammocks.	Water quality, boundary continuity.
1015791	138	Large parcel on the southern boundary of the preserve. Saltmarsh and marsh hammocks.	Water quality, boundary continuity, natural resource value.
1066883, 1064635, 1064732	126	Four parcels on the Crystal River and adjacent to the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1139848	137	Parcel contains a spring run (spring run rise and sink) which feeds into the Homosassa River.	Water quality, natural resource value.
2954060, 2954078, 2954086	36	Scrubby flatwoods, hammock, and marsh adjacent to the preserve.	Natural resource value, boundary continuity.
1097967	91.8	Large island at mouth of Withlacoochee River. Saltmarsh and marsh hammocks.	Water quality, natural resource value.
Chambers Island (Levy Co.)	62	Marsh hammock and saltmarsh. Parcel on the Crystal River.	Water quality, natural resource value.
1064724	144	Parcel nearly entirely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1008735	67	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1009294	87.5	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.

1011965	5	Completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
2597909	5	Completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
2801280	25	Completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
2792426	7.5	Completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1945500, 2890304, 2890291, 2890312	162	Area platted for development, but only a handful of parcels developed. Completely surrounded by the preserve. Marsh hammock, hydric hammock, saltmarsh.	Water quality, boundary continuity, natural resource value.
Sportsman's Island	23.6	Almost completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1013950	7	Almost completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1014182	42	Completely surrounded by the preserve. Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1015014	7	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
2621893, 1012112	42	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1016002	75.5	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1015804	2.5	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
2447133, 2324063	38	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1015171, 1015162, 2870761	14	Saltmarsh and marsh hammock.	Water quality, boundary continuity, natural resource value.
1015146	61	Flatwoods, hammock. Adjacent to large scrub/sandhill parcel.	Boundary continuity, natural resource value, fire protection.
Parcels outside Florida Forever Project boundaries			
14-17-15-02308, 13-17-15-02307, 11-17-15-02299-001-00	78	Three parcels on the Levy County side of the Withlacoochee River	Will provide a continuous habitat connection with WBPSP to the north
1050936, 2650826, 2771071, 2700599, 1050791, 1050804, 1050847, 2771160, 2771178, 2771186	467.6	Several parcels, some with related ownership east of the Hollins tract.	Boundary continuity, natural resource value, fire protection.
1114331	231	Scrubby flatwoods along Ft. Island Trail.	Boundary continuity, natural resource value, fire protection.
1114322	20	Scrub and scrubby flatwoods near the Ozello Trail/US19 intersection. Highly developable.	Boundary continuity, natural resource value, fire protection.
1114314	10	Scrub and scrubby flatwoods near the Ozello Trail/US19 intersection. Highly developable.	Boundary continuity, natural resource value, fire protection.

1114454	3.5	Scrub and scrubby flatwoods near the Ozello Trail/US19 intersection. Highly developable.	Boundary continuity, natural resource value, fire protection.
1004691	31.7	Saltmarsh and marsh hammock surrounded by the preserve.	Water quality, boundary continuity, natural resource value.
1004683	13.8	Saltmarsh and marsh hammock surrounded by the preserve.	Water quality, boundary continuity, natural resource value.
2313455	12.6	Saltmarsh and marsh hammock surrounded by the preserve.	Water quality, boundary continuity, natural resource value.
1011787, 1011795	41	Saltmarsh and marsh hammock surrounded by the preserve.	Water quality, boundary continuity, natural resource value.
River Road	54.7	Several parcels on the north side of River Road with frontage on the Withlacoochee River and scrub adjacent to the road.	Water quality, boundary continuity, natural resource value, fire protection, historical scrub jay habitat.
2651962, 2651971, 2651989	177	Property north of the Crystal River Mall. Flatwoods, hammock.	Natural resource value.
1121647, 1121612, 2594675, 1121639, 1123988		Hammock and flatwoods west and east of US19.	Water quality, natural resource value.

Appendix 13

Goals and Objectives for Crystal River Preserve State Park During 2004-2013

Goals and Objectives for Crystal River Preserve State Park During 2004-2014

The following goals and objectives were developed specifically for the Crystal River Preserve State Park. The goals and objectives presented here reflect programmatic goals and the ideas of CAMA personnel in charge of managing and protecting the area at the time the plan was developed and the property managed as a state buffer preserve. Input was also received from DRP, cooperative managers, user groups and other stakeholders from outside the DEP. Staff believe the goals and objectives area consistent with the various forms of guidance provided to managers.

The table portrays all management goals and objectives for the next ten years. The table notes if each goal and objective was included in the previous five-year plan ("Previous Plan"). It also provides the percent of each objective that was complete at the time this plan was drafted ("Percent Complete"). Each objective is marked with an X as to which of the next ten years it will be addressed by preserve staff ("Proposed Timeline"). The cost of each objective, if known, is also provided ("Estimated Cost").

Each year identified under Proposed Timeline represents the fiscal year during which an objective will be addressed, (e.g., "05" means July 2004 through June 2005). These objectives and timelines provide the priority schedule for accomplishing management actions on the preserve, as required by Florida Statutes. Objectives are listed in priority order, from highest to lowest, under each goal. Some objectives address the findings and recommendations of the Management Review Team during their last review of the area, indicated by a note following the objective (LMR recommendation).

The ability to implement the specific goals and objectives identified in this plan will be dependent upon the availability of funding resources for these purposes. Objectives that require funds above the normal baseline appropriation to be completed are indicated by "*" in the estimated cost column.

The objectives are discussed in more detail in the Chapter IV of the plan (and Chapter III for potential land acquisition and surplus).

Appendix 13: Goals and Objectives for the Crystal River Preserve State Park for 2004-2014				
Goal/Objective	**Previous Plan**	**Percent Complete**	**Proposed Timeline (fiscal year) '04 05 06 07 08 09 10 11 12 13**	**Estimated Cost ($)**
Resource Management and Protection				
Soil Management				
Goal 1: Manage soil to reduce and prevent erosion				
Objective 1a: Assess the preserve to identify major erosion areas and implement control measures as needed		On-going	'04 05 06 07 08 09 10 11 12 13	$40k
Hydrology/Water Management				
Goal 2: Maintain/restore natural flow ways and protect water quality				
*Objective 2a: Inventory hydrological changes to the preserve (ditching, plugging, dams, spoil deposition etc.) and their impacts and formulate restoration actions		50	'04 05 06 07 08 09 10 11 12 13	$50k
*Objective 2b: Restore/enhance known areas of dredge spoil [riverbank/shoreline/spoil islands] where applicable and when funding allows.		0	'04 05 06 07 08 09 10 11 12 13	$45k
Objective 2c: Assess corrective measures needed for ditched areas on the preserve		25	'04 05 06 07 08 09 10 11 12 13	$15k
*Objective 2d: Restore 50% of major hydrological alterations in the preserve (5%/year) by 2013 and complete the quarry project by 2008		30	'04 05 06 07 08 09 10 11 12 13	$175k
Natural Communities Management				
Goal 3: Restore, maintain and protect natural communities				
Objective 3a: Complete a GIS map and description of FNAI natural communities and disturbed areas on the preserve. (LMR recommendation)		80	'04 05	$15k
Objective 3b: Identify historic vegetative community types of the preserve in order to restore habitats to the proper natural community composition. (LMR recommendation)		50	'04 05 06	$20k
Objective 3b: Develop quantifiable vegetative management objectives for the preserve to ultimately achieve desired future conditions for the area's natural communities. (LMR recommendation)		50	'04 05 06 07	$25k
Native Species Management				
Goal 4: Maintain and protect the native species				
Objective 4a: Inventory native plants found on the preserve and assess their population requirements		75	'04 05 06 07 08 09 10 11 12 13	$40k
Objective 4b: Inventory native animals found on the preserve and assess their population requirements		75	'04 05 06 07 08 09 10 11 12 13	$30k
Listed Species Management				
Goal 5: Maintain and protect the listed species				
*Objective 5a: Survey listed plant species and assess their population requirements and provide information to FNAI		75	'04 05 06 07 08 09 10 11 12 13	$40k

Appendix 13: Goals and Objectives for the Crystal River Preserve State Park for 2004-2014				
Goal/Objective	**Previous Plan**	**Percent Complete**	**Proposed Timeline (fiscal year) '04 05 06 07 08 09 10 11 12 13**	**Estimated Cost ($)**
*Objective 5b: Survey listed animal species and assess their population requirements and provide information to FNAI		25	'04 05 06 07 08 09 10 11 12 13	$40k
Objective 5c: Implement the scrub jay management plan		75	'04 05	$90k
Invasive Non- native Species Management				
Goal 6: Eradicate invasive non-native species or maintain at the lowest practical level				
Objective 6a: Inventory invasive non-native species on the preserve		75	'04 05 06 07 08 09 10 11 12 13	
Objective 6b: Coordinate with FDEP Bureau of Invasive Plant Management to establish an exotic species operational plan for the preserve		On-going	'04 05 06 07 08 09 10 11 12 13	
*Objective 6c: Reduce and maintain exotic plant species to less than 5% cover and promote reestablishment of native species through seed bank recruitment		On-going	'04 05 06 07 08 09 10 11 12 13	$255k
Objective 6d: Reduce population of feral hogs by establishing a trapping program or other means as needed		On-going	'04 05 06 07 08 09 10 11 12 13	
Forest Resources Management				
Goal 7: Manage forest resources consistent with the purposes of this property, when the activities contribute to restoration management				
Objective 7a: Continue selective thinning to reduce competition from off site slash pine to restore long leaf pine. (LMR recommendation)		On-going	'04 05 06 07 08 09 10 11 12 13	$25k
*Objective 7b: Utilize a combination of prescribed fire and mechanical treatments to reduce fuel loading to minimize the risk of damaging wildfires		On-going	'04 05 06 07 08 09 10 11 12 13	$75k
Fire Management				
Goal 8: Conduct fire management operations to help restore and maintain natural communities and to mimic natural fire effects				
Objective 8a: Develop a burn plan with a GIS database for the preserve		50	'04 05	$20k
Objective 8b: Acquire necessary training and equipment for fire prescription and suppression		On-going	'04 05 06 07 08 09 10 11 12 13	$30k
*Objective 8c: Install firelines to facilitate fire management.		50	'04 05 06 07 08 09 10 11 12 13	$150k
Objective 8d: Accomplish the annual burn objectives listed in the burn plan		On-going	'04 05 06 07 08 09 10 11 12 13	$150k
Objective 8e: Coordinate with DOF to manage wildfires when they occur		On-going	'04 05 06 07 08 09 10 11 12 13	
*Objective 8f: Reduce fuel with roller chopping or mowing to facilitate burning in areas with high fuel loads (same as objective 7c)		10	'04 05 06 07 08 09 10 11 12 13	$75k
Archaeological, Historical, & Cultural Mgmt				
Goal 9: Survey, monitor and protect archaeological and historic sites on the preserve				
Objective 9a: In coordination with DHR and GARI, survey for archaeological sites and ensure they are recorded in the Master Site File		On-going	'04 05 06 07 08 09 10 11 12 13	$50k

Appendix 13: Goals and Objectives for the Crystal River Preserve State Park for 2004-2014				
Goal/Objective	**Previous Plan**	**Percent Complete**	**Proposed Timeline (fiscal year) '04 05 06 07 08 09 10 11 12 13**	**Estimated Cost ($)**
Objective 9b: Patrol archaeological and historic sites on the preserve to prevent damage		On-going	'04 05 06 07 08 09 10 11 12 13	$10k
Objective 9c: Conduct all ground-disturbing activities in accordance with DHR guidelines		On-going	'04 05 06 07 08 09 10 11 12 13	$20k
Objective 9d: Regularly assess the condition of archaeological and historic resources. Monitor the condition of sites in poor condition		On-going	'04 05 06 07 08 09 10 11 12 13	$30k
Scenic Resources Management				
Goal 10: Protect the scenic resources of the preserve				
Objective 10a: Identify the scenic resources of the preserve and potential threats to those resources		On-going		
Objective 10b: Ensure that preserve operations do not decrease the scenic qualities of the preserve, unless necessary to protect the natural resources and visitor safety		On-going	'04 05 06 07 08 09 10 11 12 13	
Security Management				
Goal 11: Establish security measures sufficient to protect the preserve's integrity and to restrict unauthorized access and use				
Objective 11a: Post and maintain the boundary of the preserve		75	'04 05 06	$10k
*Objective 11b: Fence the preserve boundary where necessary to prevent illegal use		75	'04 05 06	$75k
Research and Monitoring				
Goal 12: Facilitate and conduct scientific research and monitoring to optimally manage and protect natural communities and native plant and animal species of the preserve				
Objective 12a: Continue to monitor photo-plots in natural communities on a quarterly basis		On-going	'04 05 06 07 08 09 10 11 12 13	$45k
Objective 12b: Annually sample vegetative treatment plots		On-going	'04 05 06 07 08 09 10 11 12 13	$45k
Objective 12c: Sample small mammal and herptiles to evaluate community response to restoration on a quarterly basis		On-going	'04 05 06 07 08 09 10 11 12 13	$45k
Objective 12d: Ensure that all research and monitoring projects have all required permits from relevant agencies		On-going	'04 05 06 07 08 09 10 11 12 13	
Education and Training				
Goal 13: Educate the public and local governments concerning resources, issues and management goals/objectives of the preserve				
Objective 13a: Interact with adjacent landowners via phone, mail, and direct contact regarding management issues, such as exotics and burns		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 13b: Develop educational materials and displays, including entrance kiosk with regulations		75	'04 05 06 07 08	$75k
Objective 13c: Provide public service announcements to local and state media contacts on an as needed basis		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 13d: Participate in upwards of 30 outreach events per year		On-going	'04 05 06 07 08 09 10 11 12 13	$75k

Appendix 13: Goals and Objectives for the Crystal River Preserve State Park for 2004-2014				
Goal/Objective	**Previous Plan**	**Percent Complete**	**Proposed Timeline (fiscal year) '04 05 06 07 08 09 10 11 12 13**	**Estimated Cost ($)**
Public Access and Visitor Use				
Public Access/Parking/Handicap Facilities				
Goal 14: Provide public access to encourage secondary compatible uses where appropriate on the preserve that do not detract from the conservation and management goals and objectives (single-use concept)				
Objective 14a: As new facilities are developed, provide universal access in all cases except where the law allows reasonable exceptions (e.g., where handicap access is structurally impractical, or where providing such access would change the fundamental character of the facility being provided)		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 14b: Establish a canoe launch at or near the visitor center		0	'04 05 06 07 08	$15k
Objective 14c: Establish a boardwalk to cross a section of saltmarsh at the Dixie Shores Trail		0	'04 05 06 07 08	$50k
Objective 14d: Establish trail counters at the Eco Walk, Churchhouse Hammock, the Loop Trail, and the Redfish Hole		0	'04 05	$5k
Objective 14e: Establish a boardwalk to extend the Churchouse Hammock Trail towards the Crystal River.		0	'04 05	$50k
Education				
Goal 15: Establish locations for providing educational materials and/or programs for visitors				
Objective 15a: Enhance visitors center at the preserve office with updated educational displays		On-going		$5k
Equestrian				
Goal 16: Encourage equestrian trails and facilities where appropriate on the preserve that do not detract from the conservation and management goals and objectives				
Objective 16a: Establish an equestrian trail on the preserve in association the Cross Florida Greenway		0	'04 05 06 07	$5k
Hiking/Biking				
Goal 17: Encourage hiking/biking where appropriate on the preserve that does not detract from the conservation and management goals and objectives				
Objective 17a: Maintain 25 miles of hiking/biking trails on the preserve		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 17b: Establish trailhead facilities for Hikers and/or bikers on the preserve at the Redfish Hole, the Loop Trail, and Dixie Shores		0	'04 05 06 07	$30k

Appendix 12: Goals and Objectives for the Crystal River Preserve State Park for 2004-2014				
Goal/Objective	**Previous Plan**	**Percent Complete**	**Proposed Timeline (fiscal year) '04 05 06 07 08 09 10 11 12 13**	**Estimated Cost ($)**
Camping				
Goal 18: Allow camping where appropriate on the preserve that does not detract from the conservation and management goals and objectives				
Objective 18a: Maintain one primitive campsite on the preserve for local youth groups		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 18b: Consider providing additional primitive camping opportunities for individuals		0	'04 05 06 07	
Objective 19a: Maintain fishing access point on the preserve at the Mullet Hole, the Redfish Hole		On-going	'04 05 06 07 08 09 10 11 12 13	
Operations and Facilities				
Cost Est. & Funding Sources for Mgmt				
Goal 20: Conduct operations and obtain and maintain facilities and staff to soundly manage, protect and make accessible the preserve				
*Objective 20a: Pursue adequate levels of funding to support preserve operations including monitoring and fire management.		0	'04 05 06 07 08 09 10 11 12 13	~$80k/year
Objective 20b: Pursue alternative funding sources, such as mitigation projects, grants and fundraising, to supplement existing funds		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 20c: Provide additional office space and restrooms within the existing visitor center/office complex		0		
Analysis of Contracting Mgmt Activities				
Goal 21: Consider outsourcing those preserve operations that outside sources can conduct at less cost and with equivalent or better results than preserve staff				
Objective 21a: On a continuing basis, analyze preserve operations and identify those activities for which preserve staff do not have the expertise or that can be completed at less cost with equivalent or better results by outside sources		On-going	'04 05 06 07 08 09 10 11 12 13	
Partnerships and Regional Coordination				
Cooperating Agencies				
Goal 22: Establish and maintain relationships with other agencies to enhance management and protection of the preserve				
Objective 22a: Coordinate management efforts with other agencies including USFWS, SWFWMD, USGS, etc		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 22b: Coordinate with local law enforcement and permitting agencies regarding patrol and potential violations include SWFWMD, DEP, FWC, Citrus County Sheriff's Office, Crystal River Police department, etc		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 22c: Continue collaborative efforts with DOF, FWC, DHR, DEP and others for the protection and management of activities on the preserve		On-going	'04 05 06 07 08 09 10 11 12 13	

Appendix 12: Goals and Objectives for the Crystal River Preserve State Park for 2004-2014				
Goal/Objective	**Previous Plan**	**Percent Complete**	**Proposed Timeline (fiscal year) '04 05 06 07 08 09 10 11 12 13**	**Estimated Cost ($)**
Objective 22d: Encourage establishment of resource monitoring stations by WMD or other entities on the preserve		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 22e: Coordinate joint educational programs with other state agencies and the local education community		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 23a: Establish Citizen Support Organization and solicit volunteers to assist preserve staff to accomplish goals of the preserve		10	'04 05 06	
Objective 23b: Provide preserve and community recognition and support for volunteers		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 23c: Generate 1,000 hours per quarter from volunteers to assist in preserve management and education		On-going	'04 05 06 07 08 09 10 11 12 13	
Land Use Coordination				
Goal 24: Review, define, and minimize impacts associated with planned and existing development along or within the preserve				
Objective 24a: Continually review comprehensive plan amendments and land development regulations that govern proposed land use changes on properties adjacent to the preserve and coordinate with CAMA headquarters on comments		On-going	'04 05 06 07 08 09 10 11 12 13	
Prospective Land Acquisitions and Potential Surplus Lands				
Goal 25: Define optimum boundary and facilitate acquisition and/or surplusing of lands to achieve these boundaries				
Objective 25a: Identify lands outside of the current project boundaries that are necessary for the perpetual protection of the preserve		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 25b: Nominate for acquisition through Florida Forever all parcels that are important for management of the preserve or contain important resources		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 25c: Identify lands within the current project boundaries that are not needed for resource protection, management or use of the preserve		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 25d: Assist in the acquisition of all lands within the Florida Forever boundary parcels by providing DEP with information on development, available parcels, ownership, and local contacts every 12 months		On-going	'04 05 06 07 08 09 10 11 12 13	
Compliance with Govt. Requirements				
Goal 26: Ensure that use and management of the preserve complies with state and local government requirements				
Objective 26a: Ensure that each planned use of the preserve complies with the State Lands Management Plan adopted by the Trustees		On-going	'04 05 06 07 08 09 10 11 12 13	
Objective 26b: Ensure that each planned use of the preserve complies with the Local Government Comprehensive Plan		On-going	'04 05 06 07 08 09 10 11 12 13	

* = additional money above baseline funds needed to complete this objective

Appendix 14

Management Procedures for Archaeological and Historical Sites on State Owned or Controlled Lands

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 also 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(5), 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:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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 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:

Susan M. Harp
Historic Preservation Planner
Telephone (850) 245-6333
Suncom 205-6333
FAX (850) 245-6437

Compliance Review Section
Bureau of Historic Preservation
Division of Historical Resources
R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Appendix 15

Verification of Compliance with Local Comprehensive Plans

Board of County Commissioners

DEPARTMENT OF DEVELOPMENT SERVICES

Web Address: http://www.bocc.citrus.fl.us • Toll Free (352) 489-2120

3600 W. Sovereign Path, Lecanto, FL 34461-8070

In reply, refer to:

DS-04-142

June 21, 2004

RECEIVED

JUN 23 2004

CRYSTAL RIVER
STATE BUFFER PRESERVE

Keith Laakonen
Aquatic Preserve Manager, ESIII
St. Martin's Marsh & Big Bend Seagrasses Aquatic Preserves
3266 N. Sailboat Avenue
Crystal River, Florida 34428

Re: Management Plan

Dear Mr. Laakonen:

Thank you for providing a copy of the draft Land Management Plan. I shall have staff review for consistency with the County's Comprehensive Plan and provide written comment under separate cover.

I am willing to serve on the advisory group. Please notify me as to date, time, and location so I may reserve that date on my calendar. If my staff or I may be of any further assistance, please do not hesitate to call.

Respectfully,

Gary W. Maidhof, Director
Department of Development Services

GWM:pla
Attachment
cc: Richard Wm. Wesch, County Administrator
Charles Dixon, Community Development Director
Bernie Sorenson, Environmental Planner

City of Crystal River

123 Northwest Highway 19
Crystal River, Florida 34428
Telephone: (352) 795-4216
Facsimile: (352) 795-6351

August 12, 2004

Michael J. Kinnison, AICP
Park Planner
Department of Environmental Protection
Mail Station 525
3900 Commonwealth Blvd.
Tallahassee, FL 32399-3000

Project: Proposed management plan for the Crystal River State Buffer Preserve

Dear Mr. Kinnison:

Thank you for the opportunity to review the proposed management plan for the Crystal River State Buffer Preserve.

Three areas of the State Buffer Preserve lie within the city limits of Crystal River. These include: (1) an area west of US 19 to the eastern boundary of the Crystal River; (2) approximately 700 acres south of W. State Park St. and west of the Old Tallahassee Rd.; and (3) two sites that incorporate both the current DEP office located at 3266 N. Sailboat Ave. and an area south of and adjacent to the State Archaeological Site. Area (1) is designated as Conservation on the Future Land Use Map. Area (2) is designated as Coastal Preservation and Area (3) is designated as Public/Semi-Public and the Future Land Use Map.

The *Conservation* land use is "for lands set aside for the protection and/or preservation of natural resources, while allowing very low density residential at one unit per two acres and recreation." (CRCP, Future Land Use Element). The *Coastal Preservation* land use is for "areas within the City which exhibit significant environmental, cultural, or historical characteristics that may be sensitive to certain forms and intensities of development. Generally these parcels are greater than twenty (20) acres in area, and represent a mixture of uplands and environmentally sensitive lands." (CRCP, Future Land Use Element) The proposed management plan is consistent with these designations. Both the Management Plan and the Crystal River Comprehensive Plan emphasize the preservation and protection of environmentally sensitive land and natural resources.

The *Public/Semi-Public* land use designation is compatible with the use of the property occupied by the DEP office.

If you have any questions, please call me at (352) 795-6511.

Sincerely,

Nancy H. Smith

Nancy H. Smith
Planner

Cc: Susan R. Boyer, City Manager
Paul Vargoshe, Building Official
Nick Robbins, Resident Park Manager
Keith Laakkonen, Environmental Specialist III

Appendix 16

Land Management Review

Land Management Review of Crystal River State Buffer Preserve, Citrus County (Lease No. 4084): June 28, 2000

Prepared by Division of State Lands Staff

Delmas Barber, OMC Manager
David Petti, Environmental Specialist II

For
The Crystal River State Buffer Preserve Management Review Team

Final Report August 1, 2000

Land Manager:	Mr. Matt Clemons, Office of Coastal and Aquatic Managed Areas (CAMA)
Area:	36,000 Acres
County:	Citrus
Mngt. Plan Approved:	09/24/1997
Mngt. Plan Update Due:	09/24/2002

Management Review Team Members

Agency Represented	Team member Appointed	Team member in attendance
DEP/DRP	Mr. Nick Robbins	Mr. Nick Robbins
DEP District	Ms. Dianne McCommons-Beck	Ms. Dianne McCommons-Beck
DACS/DOF	Mr. Wes Howell	Mr. Wes Howell
FWCC	Ms. Nancy Dwyer	Ms. Nancy Dwyer
Citrus County Commission	Mr. Lou Phemister	Mr. Lou Phemister
Private Land manager	Mr. Ellison Hardee	Mr. Ellison Hardee
Private Conservation Organization	Ms. Helen Spivey	Ms. Helen spivey
Citrus County SWCD	Inactive	Inactive

Process for Implementing Regional Management Review Teams

Legislative Intent and Guidance:

Chapter 259.036, F. S. was enacted in 1997 to determine whether conservation, preservation, and recreation lands owned by the state Board of Trustees of the Internal Improvement Trust Fund (Board) are being managed properly. It directs the Department of Environmental Protection (DEP) to establish land management review teams to evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions, and archaeological features. The teams also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan. If a land management plan has not been adopted, the review shall consider the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices are in compliance with the management policy statement and management prospectus for that property. If the land management review team determines that reviewed lands are not being managed for the purposes for which they were acquired or in compliance with the adopted land management plan, management policy statement, or management prospectus, DEP shall provide the review findings to the Board, and the managing agency must report to the Board its reasons for managing the lands as it has. A report of the review findings are given to the managing agency under review, the Acquisition and Restoration Council (ARC), and to the Division of State Lands. Also, DEP shall report the annual review findings of its land management review teams to the Board no later than the second board meeting in October of each year.

Review Site

The management review of the Crystal River State Buffer Preserve considered approximately 36,000 acres in Citrus County that are managed by CAMA. The team evaluated the extent to which current management actions are sufficient, whether the land is being managed for the purpose for which it was acquired, and whether actual management practices, including public access, are in compliance with the management plan. The Division of State Lands approved the management plan on September 24, 1997 and the management plan update is due September 24, 2002.

Review Team Determination

Is the land being managed for the purpose for which it was acquired?

After completing the checklist, team members were asked to answer "yes" or "no" to this question. All team members agreed that Crystal River State Buffer Preserve is being managed for the purpose for which it was acquired.

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

After completing the checklist, team members were asked to answer "yes" or "no" to this question. All team members agreed that actual management practices, including public access, were in compliance with the management plan for this site.

Commendations to the managing agency

The following commendation's resulted from a discussion and vote of review team members.

1. The team commends CAMA staff for an exceptional job in sharing funding between the different units for resource management and environmental education. (7 for/0 against)

2. The team commends the staff for their efforts and involvement in the local Eco Heratidge Tourism Community. (7 for/0 against)

3. The team commends preserve staff for their cooperation with other agencies, particularly Gulf Archeology Research Institute. (7 for/0against)

4. The team commends preserve staff for seeking supplemental funding through grants. (7 for/0against)

Exceptional management actions

The following items received high scores on the review team checklist (see Attachment 1), which indicates that management actions exceeded expectations.

- Non-native invasive species control (Plants)

Recommendations and checklist findings

The management plan must include responses to the recommendations and checklist items that are identified below.

Recommendations

The following recommendations resulted from a discussion and vote of review team members.

1. The team recommends that FTE positions be established in lieu of current OPS positions for the Buffer Preserve. (7 for/0 against)

   Response: We agree that for management consistency and for maintaining high standards of management performance the stability of FTE positions are preferred over OPS positions. As always, funding and staffing are contingent on DEP/CAMA budget resources and priorities, and on legislative action.

2. The team recommends that pine plantation restoration sites be prioritized based upon site natural values in the updated management plan. (7 for/0 against)

   Response: Plantation restoration has been prioritized based on site natural values and a plan will be included with the next update of the management plan.

Checklist findings

The following items received low scores on the review team checklist (see Attachment 1), which indicates that management actions were insufficient (*f)* or that the issue was not sufficiently addressed in the management plan (*p*). These items need to be addressed in the management plan update.

1. Multiple Use Practices: Apiaries *(p)*

Manager's Response: The apiary issue will be more fully discussed in the revised management plan.

ATTACHMENT 1

The management review checklist was analyzed as follows: The checklist consisted of two parts: a plan review section that answered whether or not the management plan sufficiently addressed protection/ restoration/ management needs for a series of items; and a field review section that scored to what extent sufficient management actions were being taken for a series of items. For each item in each section the scores for all team members were averaged. Some items received high scores (≥ 4.0) in the field review, which indicates that exceptional management actions are being taken. Some items received low scores (≤ 0.5 for plan review; ≤ 2.0 for field review), which indicates that they were not sufficiently addressed in the plan, or that management practices did not meet expectations. These items must be addressed in the management plan update.

PLAN REVIEW			A	B	C	D	E	F	G		Avg
Upland mixed forest	I.A.1		0	1	1	1	1	1			0.8
Prairie hammock	I.A.2		0	1	1	1	1	1	1		0.9
Marine tidal marsh/swamp	I.A.3		0	1	1	1	1	1	1		0.9
Sandhill	I.A.4		0	1	1	1	1	1	1		0.9
Mesic flatwoods	I.A.5		0	1	1	1	1	1	1		0.9
Depression marsh	I.A.6		0	1	1	1	1	1	1		0.9
Floodplain swamp	I.A.7		0	1	1	1	1	1	1		0.9
Xeric hammock	I.A.8		0	1	1	1	1	1			0.8
Hydric hammock/bottomland	I.A.9		0	1	1	1	1	1	1		0.9
Shell mound	I.A.10		0	1	1	1	1	1	1		0.9
Pine flatwoods	I.A.11		0	1	1	1	1	1	1		0.9
Scrub	I.A.12		0	1	1	1	1	1	1		0.9
Animals	I.B.1		0	1	0	1	1	1	1		0.7
Plants	I.B.2		0	1	0	1	1	1	1		0.7
Cultural Res. Survey	II.A		1	1	1	1	1	1	1		1.0
Protection and preservation	II.B		0	1	0	1	1	1	1		0.7
area being burned	III.A1		1	1	0	0	1	1			0.7
frequency	III.A.2		1	1	0	0	1	1	1		0.7
quality	III.A.3		1	1	0	0	1	1	1		0.7
Borrow pits	III.B.1		0	1	1	1		1	1		0.8
Pine plantations	III.B.2		1	1	1	1		1	1		1.0
Pasture	III.B.3		0	1	1	1		1	1		0.8
Animals	III.D.1		0	1	0	1	1	1	1		0.7
Plants	III.D.2		1	1	1	1	1	1	1		1.0
Roads	III.E.1.a		0	1	0	1	1	1	1		0.7
Soil erosion	III.E.1.b		0	1	1	1	1	1	1		0.9
Spoil piles	III.E.1.c		0	1	1	1	1	1	1		0.9
Surface water quality	III.E.3.a		1	1	1		1	1	1		1.0
Surface water quantity	III.E.3.b		0	1	0			1	1		0.6
Boundary survey	III.F.1		0	1	0	1	1	1	1		0.7
Gates & fencing	III.F.2		0	1	0	1	1	1	1		0.7
Signage	III.F.3		0	1	0	1	1	1	1		0.7
Law enforcement presence	III.F.4		0	1	0	1	0	1	1		0.6
Driftwood harvest	III.F.5		1	1	0	1	1	1	1		0.9
Poaching	III.F.6		0	1	0	1	1	1	1		0.7
Unauthorized camping	III.F.7		0	1	0	1	1	1	1		0.7
Expanding development	III.G.1a		0	1	0		1	1	1		0.7
Mining	III.G.1b		0	1	0		1	1	1		0.7
Inholdings and additions	III.G.2		1	1	0	1	1	1	1		0.9
Apiaries	III.H.1		0	1	0		1	0	1		**0.5**
Public access/roads	IV.1a		0	1	1	1	1	1	1		0.9
Public access/parking	IV.1b		0	1	1	1	1	1	1		0.9

Public access/water access	IV.1c		0	1	1	1	1	1	1		0.9
Recreational opportunities	IV.2		1	1	1	1	1	1	1		1.0
Interpretive facilities and signs	IV.3		1	1	1	1	1	1	1		1.0
Environmental ed./outreach	IV.4		1	1	1	1	1	1	1		1.0
Field Review			A	B	C	D	E	F	G		
Upland mixed forest	I.A.1		3	3	3	4	3	4	3		3.3
Prairie hammock	I.A.2		3	3	4	4	3	4	3		3.4
Marine tidal marsh/swamp	I.A.3		3	3	4	4	3	4	3		3.4
Sandhill	I.A.4		3	3	3	2	3	4			3.0
Mesic flatwoods	I.A.5		4	3	4	3	3	4	3		3.4
Depression marsh	I.A.6		3	3	4	4	3.5	4	3		3.5
Floodplain swamp	I.A.7		3	3	3	3	3	4	3		3.1
Xeric hammock	I.A.8		3	3	3	3	3	4	3		3.1
Hydric hammock/bottomland	I.A.9		3	3	3	3	3	4	3		3.1
Shell mound	I.A.10		3	3	4	3	3	4	4		3.4
Pine flatwoods	I.A.11		4	3	4	3	3	4	3		3.4
Scrub	I.A.12		4	3	4	3	3	4	3		3.4
Animals	I.B.1		3	3	4	3	3	5	4		3.6
Plants	I.B.2		3	3	3	4	3	5	4		3.6
Cultural Res. Survey	II.A		4	4	4	3	4	3	4		3.7
Protection and preservation	II.B		3	4	4	3	3	3	3		3.3
area being burned	III.A1		3	3	4		3	5	3		3.5
frequency	III.A.2		3	3	3		3	4	3		3.2
quality	III.A.3		3	2	3		3	3	3		2.8
Borrow pits	III.B.1		3	3	3		3	5	3		3.3
Pine plantations	III.B.2		4	3	4		3	4	3		3.5
Pasture	III.B.3		3	2	3		3	4	3		3.0
Animals	III.D.1		3	4	3	3		4	3		3.3
Plants	III.D.2		4	4	4	4		4	4		4.0
Roads	III.E.1.a		3	3	3	3	3	5	3		3.3
Soil erosion	III.E.1.b		3	3	3	3	3	5	3		3.3
Spoil piles	III.E.1.c		3	3	3	3	3	5	3		3.3
Surface water quality	III.E.3.a		3	3	4	3	3	4	3		3.3
Surface water quantity	III.E.3.b		3	3	3	3		4	3		3.2
Boundary survey	III.F.1		3	3	3	3	3	4	3		3.1
Gates & fencing	III.F.2		3	3	3		3	4	3		3.2
Signage	III.F.3		3	3	3	4	3	4	3		3.3
Law enforcement presence	III.F.4		3	3	4	3	2	2	3		2.9
Driftwood harvest	III.F.5		3	3	3	3		4	4		3.3
Poaching	III.F.6		3	3	3	3		4	3		3.2
Unauthorized camping	III.F.7		3	3	3	3		2	3		2.8
Expanding development	III.G.1a		3	3	3	3	3	3	3		3.0
Mining	III.G.1b		3	3	3	3	3	3	4		3.1
Inholdings and additions	III.G.2			3	3	3	3	3	3		3.0
Apiaries	III.H.1		3	3	3	3	3	4	3		3.1
Public access/roads	IV.1a		3	4	3	3	3	4	3		3.3
Public access/parking	IV.1b		3	3	3	2	3	4	3		3.0
Public access/water access	IV.1c		3	3	3	2	3	3	3		2.9
Recreational	IV.2		4	3	4	3	3	4	3		3.4

opportunities											
Interpretive facilities and signs	IV.3		4	3	4	3	3	4	4		3.6
Environmental ed./outreach	IV.4		4	3	5	4	3	4	4		3.9
Waste disposal	V.1a		3		3	3	3	3	3		3.0
Sanitary facilities	V.1b		3	3	3	2	3	3	2		2.7
Buildings	V.2a		3	4	3	3	3	3	3		3.1
Equipment	V.2b		3	4	3	3	3	3	3		3.1
Staff	V.3		3	3	3	2	3	3	2		2.7
Funding	V.4		3	3	3	3	3	3	3		3.0
Purpose for acquisition											
Fishing	VI.A.1		1	1	1	1	1	1	1		1.0
Hiking	VI.A.2		1	1	1	1	1	1	1		1.0
Nature study	VI.A.3		1	1	1	1	1	1	1		1.0
Camping	VI.A.4		1	1	1	1	1	1	1		1.0
Biking	VI.A.5		1	1	1	1	1	1	1		1.0
Youth camp	VI.A.6		0	1	1	1		1	1		0.8
Horseback riding	VI.A.7		0	1	1	1		1	1		0.8